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THE PICTURE ON THE COVER

Whether it is a small bakhari, *like the one in the picture, or a big godown, where farmers store their grain, they have to take all precautions to safeguard it against storage enemies.*

—Photo by Gurcharan Singh

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3 - FEB 1962
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RURAL EXTENSION TRAINING CENTRE

EXTENSION

THE FARM AND FARM HOME MAGAZINE

Vol. II January, 1962 No. 7

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Be **SAFE** with PESTICIDES

By D. B. REDDY

PESTICIDES are pesticides because they are poisons. But what you should not forget is that they are poisons for higher animals too, including you !

Hence, be careful how you handle, store and use these pesticides. In other words, be safe with pesticides.

To be safe with pesticides, you should know all the precautions you need to take in handling or using them.

When you buy a pesticide, read the label carefully, and follow the instructions given on it; keep the pesticide in a labelled container only.

Store pesticides under a lock in a safe place and out of reach of children or other persons who don't know about it, and pets; *never* store pesticides near food-stuffs or medicines.

CDS53

In case you have the pesticide in bags, do not tear open the bags, but cut them open with a knife.

Use protective clothing and other devices while handling dangerous pesticides. This is a *must*.

Prepare spray solutions from concetrated and dangerous pesticides in deep bottomed vessels. Use long handled mixers. This will protect you from the splashes of the pesticide. It will also be easy for you to stir the solution standing up.

Wash your hands thoroughly with soap and water every time

(i) you fill the sprayer or duster with pesticides;

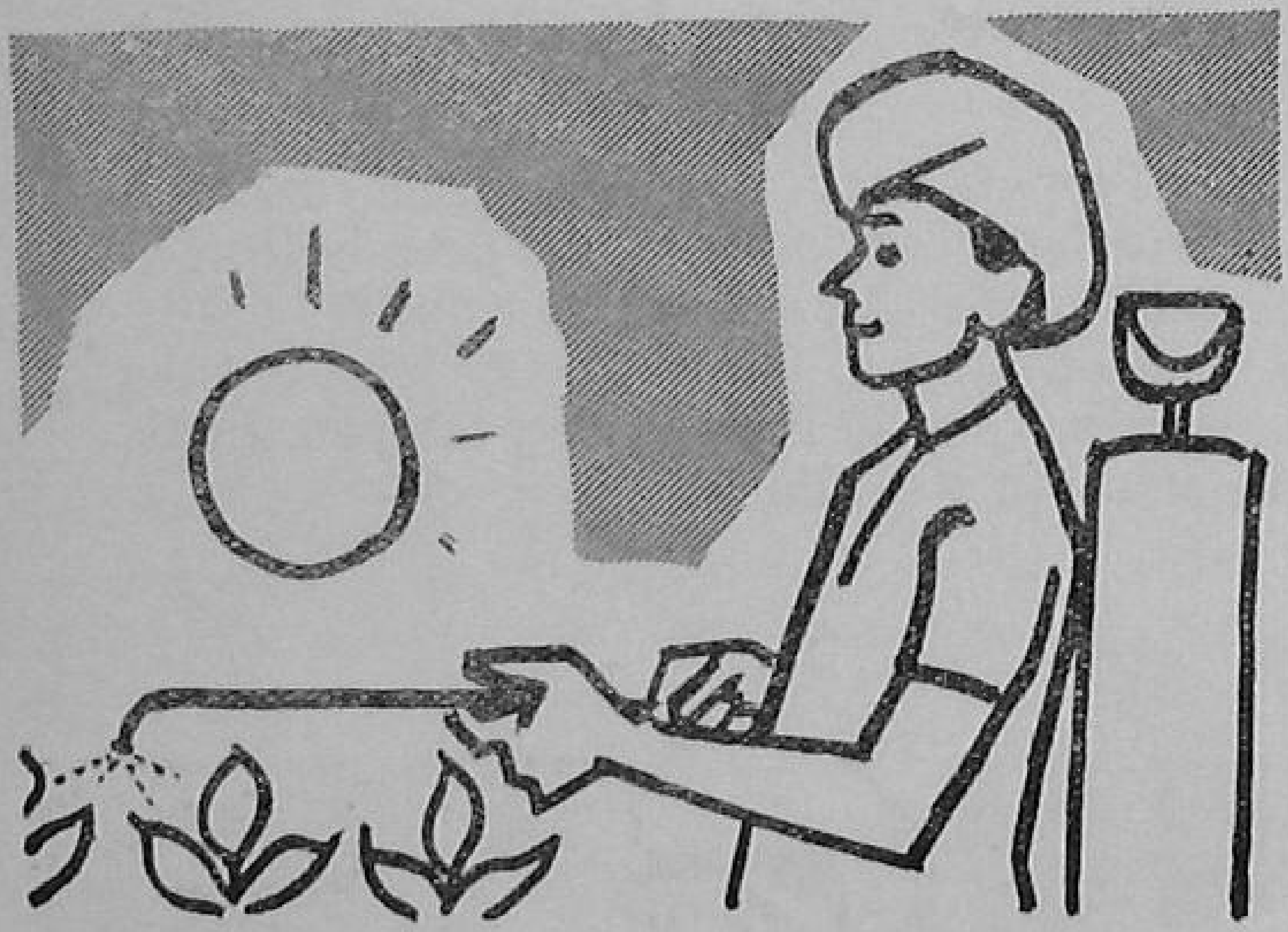
(ii) before eating, drinking or smoking; and

(iii) at the end of the day's work.

Do not use the empty containers of dangerous pesticides for any other purpose. If you have no use for such containers, dispose them off.

Properly dispose of the water or any other liquid used in the washing of the equipment and of the mixing vessels. Scatter it over barren land or throw it in a deep pit.

Use separate clothes for working with pesticides. Wash and change them as often as possible.



Do not work or allow the operator to work for more than eight hours a day. Have the operators engaged in the handling of dangerous pesticides checked by a doctor periodically.

Do not spray or dust dangerous pesticides in lakes, ponds or rivers if the water from these sources is used for drinking.

Do not keep your food and drinking water near the pesticides and in the area of operation.

Do not use pesticides on farm animals without consulting your veterinary doctor.

←

It is a safe rule to keep a first aid box, phenobarbitol, amylnitrite pearls, atropine sulphate 1/100 grain tablets and the 'universal antidote' handy while handling and using pesticides.

If symptoms of illness occur during or shortly after spraying or dusting, call a physician or get the patient to the nearest hospital immediately.

FIRST AID

While you are waiting for the doctor to arrive or till the patient is taken to a hospital or dispensary, use the following first aid methods.

SWALLOWED POISONS

If the poison has been swallowed, empty the stomach of the patient as soon as possible. To do this, give him an 'emetic' of warm salt solution, ground mustard and water (1 teaspoonful in a glass of warm water) or 'ipecac' (1 teaspoonful in a glass of warm water). You can also make the patient vomit by tickling his throat or inserting the index finger far down the throat.

Do not make the patient vomit if he is in a coma, or is unconscious or having convulsions, and also, when the patient has swallowed petroleum products, such as kerosene, gasoline, etc., or corrosive acids or caustic alkalies (symptoms : severe pain, burning sensation in the mouth and throat and vomitting).

After the stomach has been emptied as completely as possible, give him a 'demulcent' such as raw eggs, milk or a thin flour paste. Poison taken through the mouth can be absorbed by medical carbon (animal charcoal), which will also lessen the irritation to membrances of the digestive canal.

If the poison taken, is known, try emergency treatment immediately.

INHALED POISONS

1. Carry the patient (do not let him walk) to fresh air immediately.
2. Open all doors and windows.
3. Loosen all tight clothing.
4. Apply artificial respiration if breathing is stopped or is irregular. Avoid too much of pressure on the chest.
5. Prevent the patient getting chill; wrap him in a blanket and keep him as quiet as possible.
6. If the patient is convulsing, keep him in bed in a dark room. Avoid noise.
7. Do not give alcohol in any form to him.

SKIN CONTAMINATION

1. Wash the skin with warm soapy water.
2. Apply a stream of water on the skin while removing the clothing.
3. Cleanse the skin thoroughly with water.
4. *Wash quickly.* This is most important in reducing the injury to the skin.

EYE CONTAMINATION

1. Hold the eye-lids open.
2. Wash the eyes gently with a stream of running water immediately. If you delay by even a few seconds, injury will be greater.
3. Continue washing until a physician arrives.
4. Do not use chemicals. They may make the injury worse.

PREVENTION FROM COLLAPSE

1. Cover the patient with a light blanket; raise the foot of the bed; do not use a hot water bottle.
2. Give strong tea or coffee (tea is useful for children).
3. Do not exhaust the patient by too much or too vigorous a treatment.
4. A physician or a trained dispensary chemist can do these :

   (a) Apply elastic bands to the arms and legs.

   (b) Give hypodermic injection of stimulants, such as caffeine and epinephrine.

   (c) Give five per cent dextrose solution intravenously.

   (d) Give a blood or plasma transfusion.

DON'T DO THESE

some wrong ways

Do not keep your food or drinking water in the area of operation

Do not blow, suck or apply the mouth to any spraying equipment

of handling pesticides

Do not mix the chemicals with your hands

Do not eat or smoke while spraying

Spray your coconuts now

IN areas where root and leaf disease appear on coconut palms during January-February make arrangements for spraying the palms now. You can use Bordeaux mixture or a solution of any one of the copper fungicides available in the market, for spraying. Repeat the spraying in April-May and again in September-October.

To make the spraying effective take these precautions : clean the crown of the palms thoroughly ; cut off the affected areas of the leaves of diseased palms and burn ; replace all old spathes, stipules and other parts of the sprayer if those are not in good condition.

If you can't make your own arrangements for spraying, contact your Agricultural Officer.

This way CANES sprout better

ONE main reason for low yields of sugarcane in the North is poor germination of setts. Because of low temperature at the time of planting and sudden hot conditions later, germination of cane setts here is hardly 30 to 40 per cent as against 80 to 90 per cent in the South.

Studies at the Sugarcane Research Institute, Ludhiana, Punjab, have shown that if germination can be improved the yield can also be improved. And, germination can be improved by treating sugarcane setts with an organo-mercurial fungicide. With such a treatment, germination improved by 25 to 30 per cent and per acre yield increased by 90 to 100 maunds.

You can use any one of the many such fungicides now available in the market. 'Agallol' (Bayer Agri-Chem), 'Aretan' (Imperial Chemical Industry) and 'Shell Seed Dresser,'W' (Burmah-Shell) are some of them. You have to treat sugarcane setts by dipping them in a five per cent solution of the fungicide. One pound of fungicide will be required to treat the seed setts for an acre.

The Punjab farmers too can harvest a rich cane crop if they improve the germination of setts

Germination can be improved by treating the setts before planting

A pound of the chemical will cost you Rs. 4.50 to 5.50.

This is how you treat the seed setts.

Prepare the solution in two lots. Take 100 pounds of water and half a pound of fungicide. Dissolve the fungicide first in a small quantity of water, stirring well with a piece of cane or a stick (Don't dip your hand in the solution). Later on add the remaining water to the solution. This will give you a five per cent solution.

Put the cane setts in a small basket. Dip the basket in the solution and take it out. To avoid wastage, keep this basket in a bigger one to drip into a bucket. You can then re-use the solution that has dripped from the setts.

When the solution gets muddy and smaller in volume, use the other lot (another half pound in 100 pounds of water).

Plant the setts.

The fungicides you use are very poisonous and, hence, handle them with great care. Don't use containers in which the solution has been prepared for any other purpose. Never pour the used-up solution near any well or water source. Do not allow any worker with bruised or wounded hands to handle the solution. After treatment, wash the hands and legs twice or thrice.

Treat the cane setts this way. You will be spending four to six rupees in the process, but you will get many more maunds of cane as your reward.

A harrow
for the plains and the hills

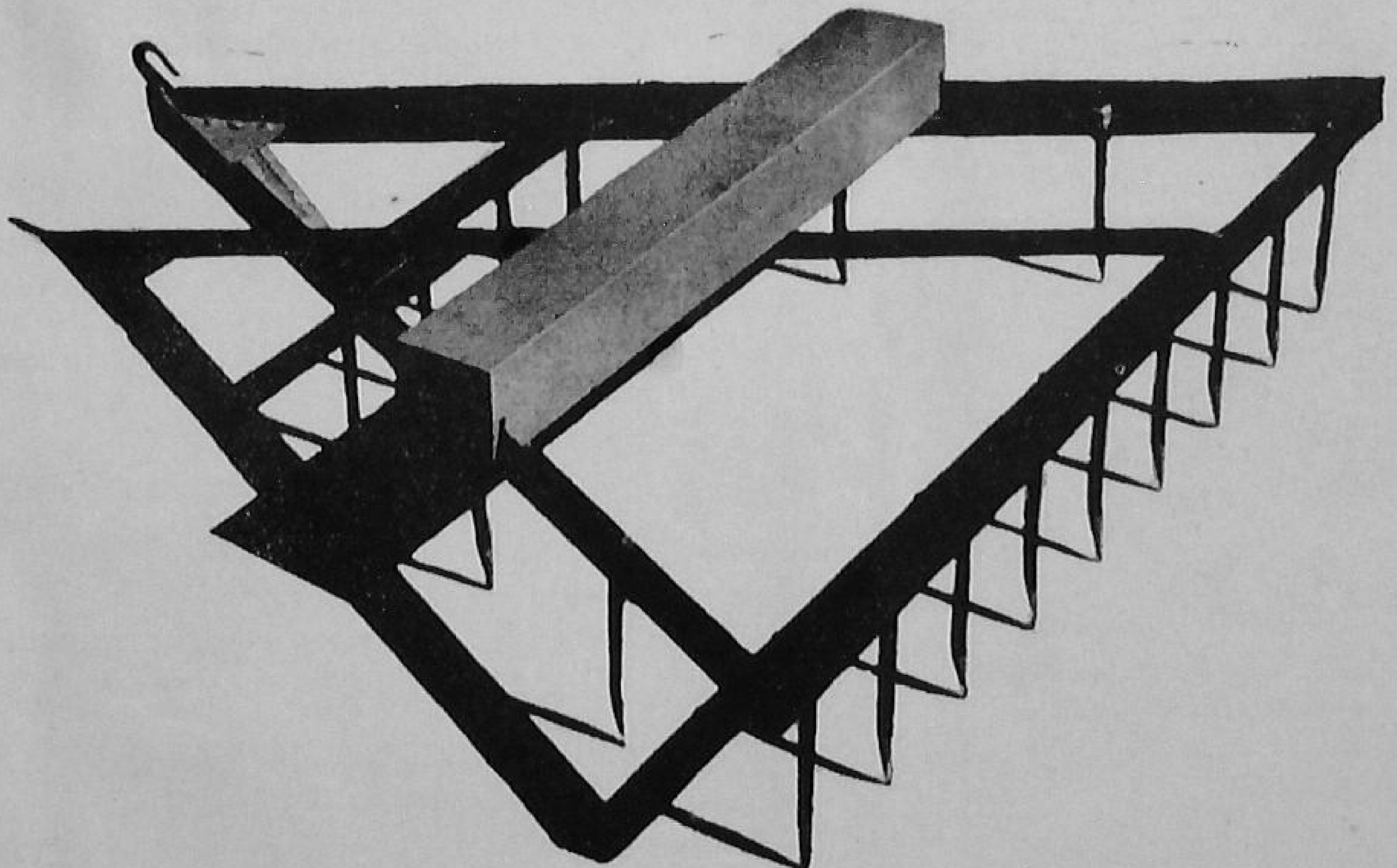
By D.N. KHERDEKAR

AN implement that will be very useful for smoothening the lands, breaking up the clods, covering seed after sowing and for interculture is the triangular spike-toothed harrow. It is very popular with the Punjab farmers.

The implement has a wooden or steel frame—triangular in shape. To this frame are attached 10 to 15 pointed pegs. These pegs are fixed by means of nuts. These pegs can be removed for straightening or sharpening when bent or worn out.

The harrow has a hook in front with which it is yoked. An average pair of bullocks can easily pull the harrow. By fixing two wooden planks on the harrow, a man can ride on it.

It is simple, and can be made or repaired by a village blacksmith. For preparing the field for *rabi* crop, you will find this harrow useful.



A harrow of similar type but smaller in size has been developed by the Nahan Factory, Himachal Pradesh. Such a harrow has been found suitable for hill areas.

A triangular spike-toothed harrow will cost you Rs. 30 to 45, depending upon the material used for the frame.

NO CEREALS IN THIS POULTRY FEED

If you have been using the standard all-mash method of feeding your poultry birds, you have been making up the feed with two thirds of cereals.

Recent research at the Government Agricultural College and Research Institute, Ludhiana (Punjab), now shows that you can have a poultry ration without any cereal in it.

At the Institute, various mashes were tried out. Of them, this one gave the best results.

Wheat bran	10 parts by weight
Groundnut cake	15 ,,
Meat-meal	10 ,,
Corn gluten	20 ,,
Rice polish	20 ,,
Penicillin mycelia	5 ,,
Molasses	15 ,,
Bone-meal	1 ,,
Ground limestone	3 ,,
Salt	0.5 ,,
Manganese sulphate	10 grams
Vitamin A	0.5 gram
Vitamin D 3	0.1 gram

With this mash, it was found that the body weight of the chicks at eigth week was better than that fed with the standard ration. The cost of this ration was also very much lower than the mash prepared with cereal.

It was seen that if poultry birds were fed with the mash, there was no need to feed grains separately.

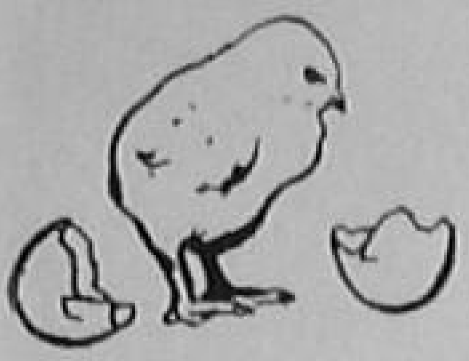
The mash can be used for growth as much as for egg-laying.

Since the mash contains synthetic vitamins A and D 3 in powder form (which is available in the market), there's no need to feed birds either with greens or shark liver oil.

By taking to this mash for feeding your birds, you will be saving the grains which can be used for human consumption.

—*S.G.I.*

How are your HATCHING results?



By S. G. IYER

Do you keep 'hatchability' records of your hens ?

If you keep 20 fertile eggs from a hen for hatching, and 18 of them hatch out, you say that this hen's hatchability is 90 per cent. This percentage is a good one, and you should try and see that you always get this hatchability from your hens.

A hatching result of nine out of ten eggs is what you should expect

When you keep the same cock in the breeding pen for a number of years, hatchability goes down. Hence, make it a rule to put new cocks once every two or three years in the pens. Also, when you cross two breeds, you get better hatchability.

You can improve the hatchability of your flock by continuously selecting birds which have a good hatchability record for breeding purposes.

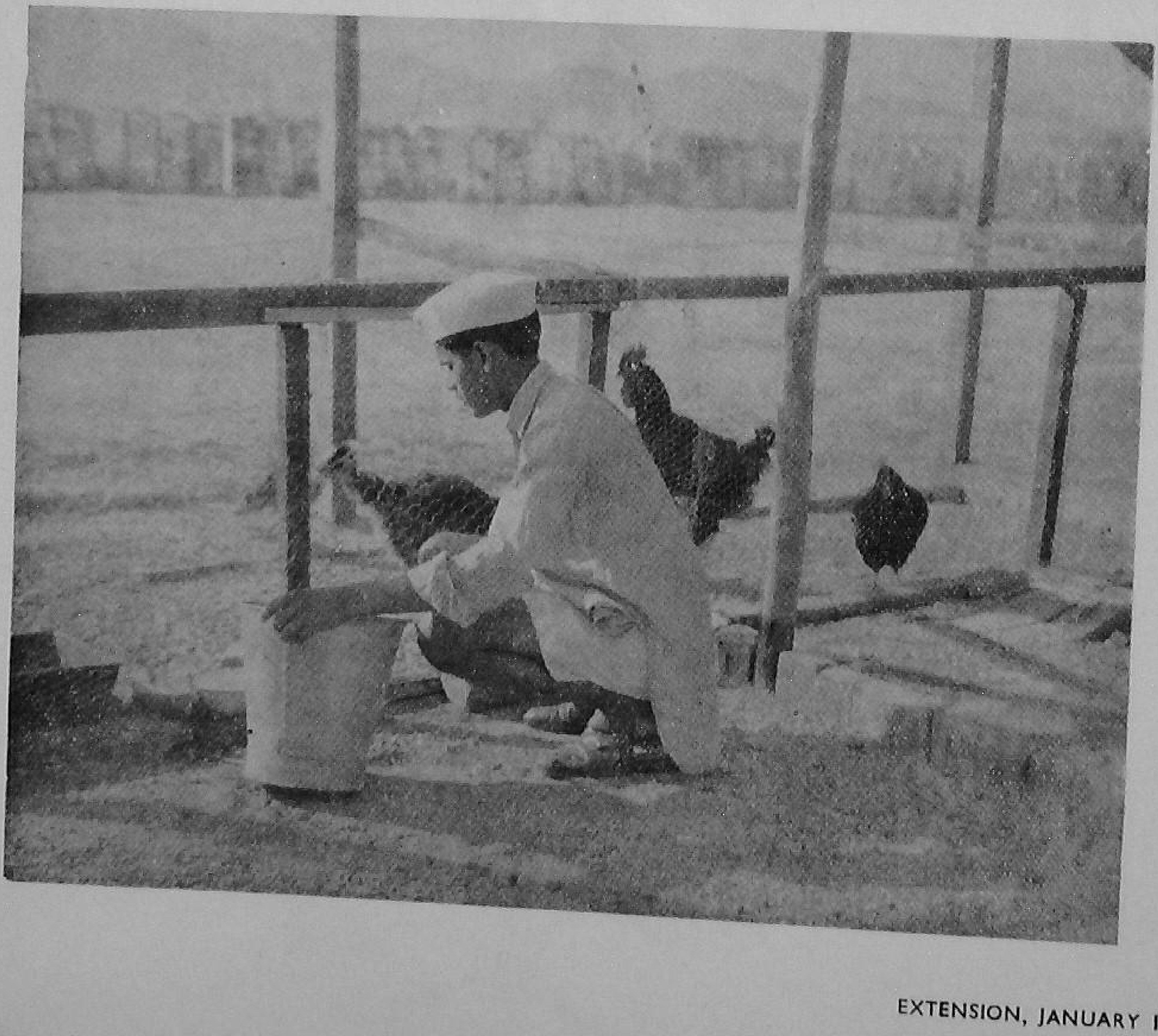
AGE

There are many other things which affect hatchability in birds. Age is one. Normally, pullets give better hatchability than the older birds. If you select good hatchers from among these birds in the first year, you will get good hatchability from them in the following years too. Birds which are poor hatchers in the first year remain so in the subsequent years also.

FEEDING

If you are giving your breeding birds a feed which is not balanced, or when the feed

Big eggs or small—proper feeding makes all the difference



lacks in certain minerals like manganese, hatchability becomes poor.

Separated milk given as a drink in addition to fish-meal or meat-meal in the ration improves hatchability.

For good hatchability, the shell must be sound. Hence, provide enough calcium (lime) through ground limestone or oyster shell in the mash. The embryo inside the egg will also make use of the calcium to build its bones.

MANAGEMENT

Hatchability will be good only if you are not only careful in feeding but also in the management of your birds. Birds need exercise too. Give them enough space for this in the runs. An acre area would be sufficient for 200 birds.

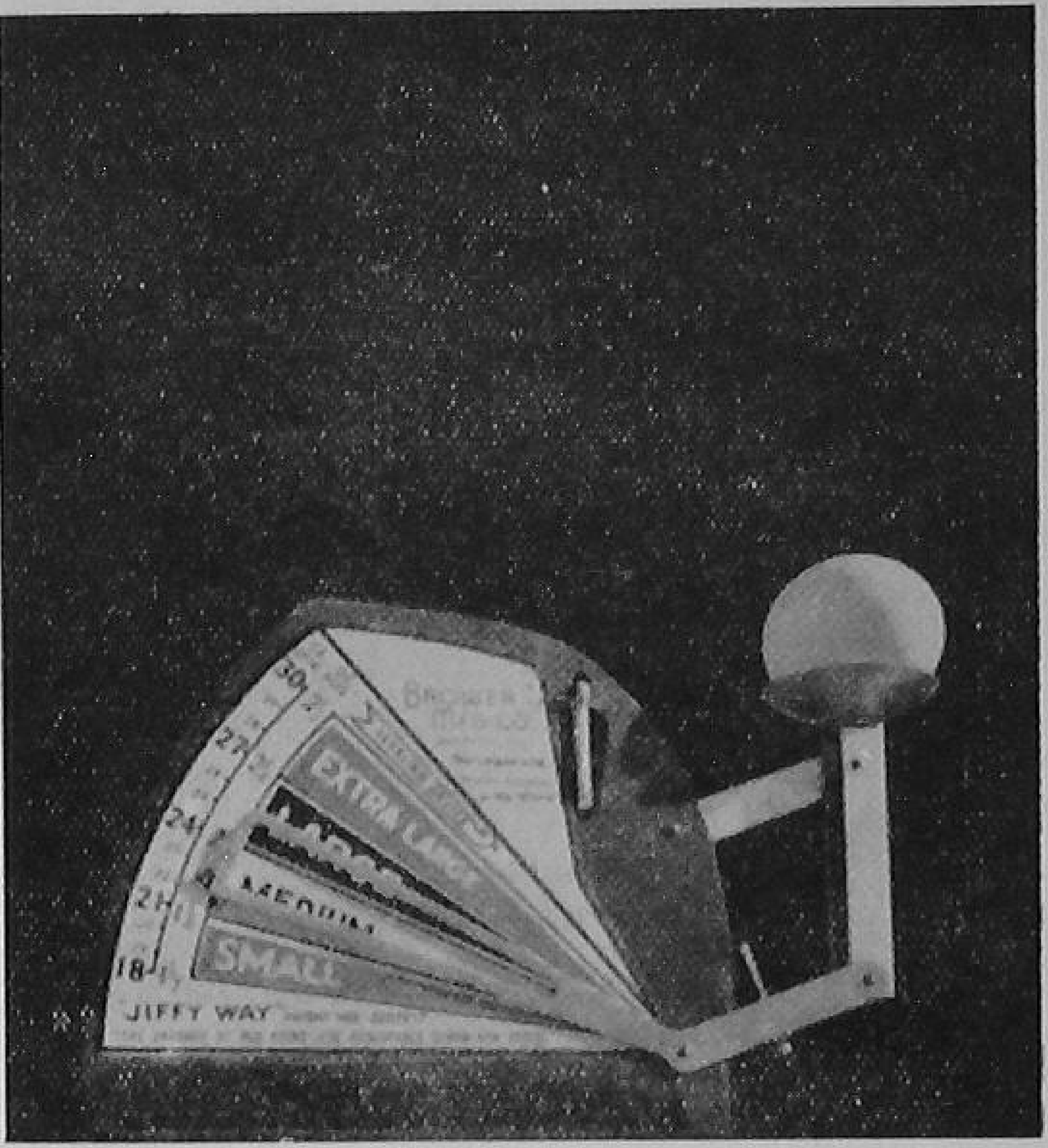
Ample sunlight is another important need for birds. So are green feeds.

Don't expect good hatchability from very young pullets, or from breeders of low vigour, or from very fat birds.

Overcrowding, keeping birds in unhygienic surroundings and poor sanitation—all lower hatchability.

SEASON

You won't get good hatchability in the hot summer months when you artificially



A two-ounce (normal-sized) egg hatches better

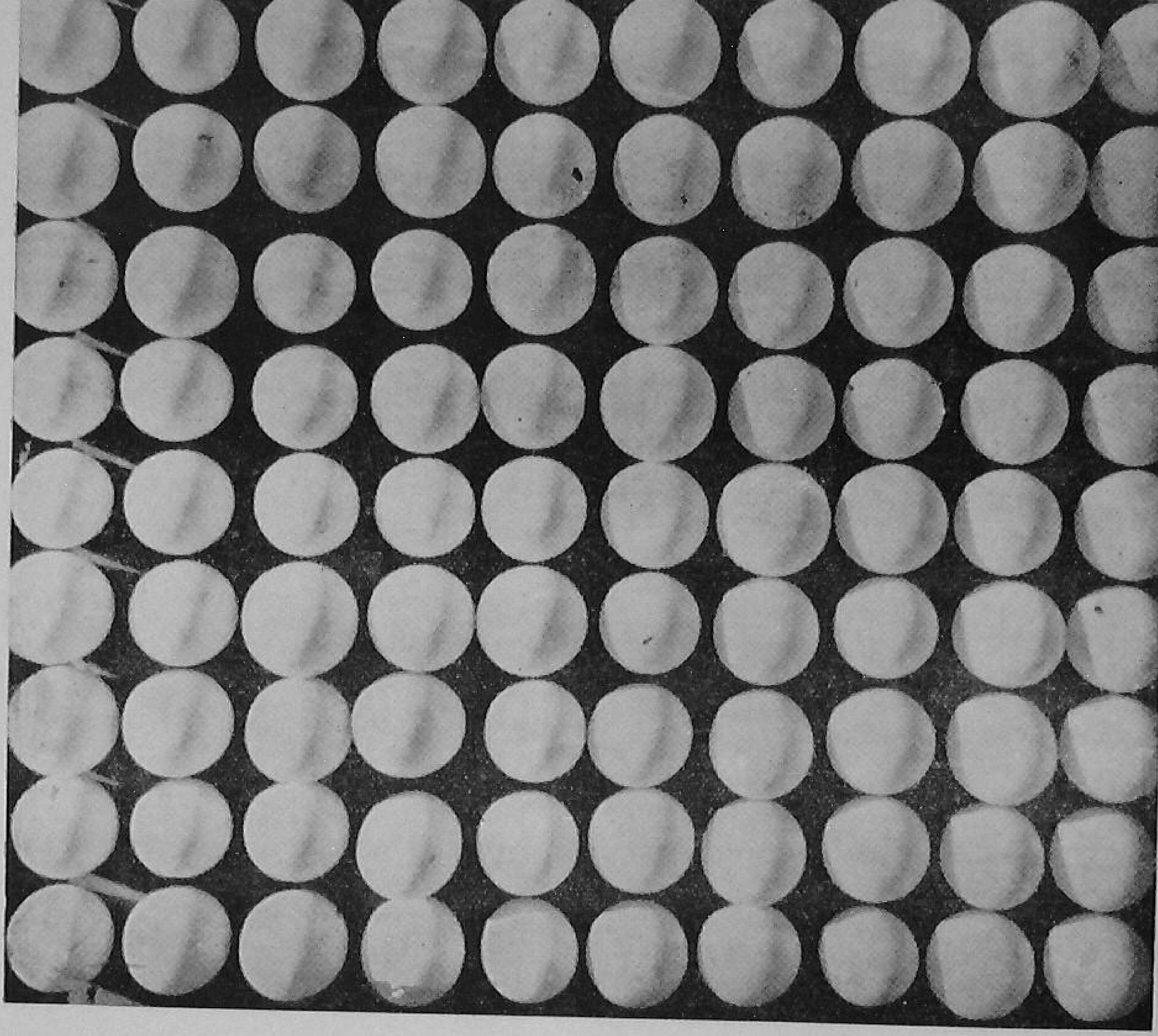
incubate eggs. In the *loo* season, hatchability of even the best birds can go down.

Hatchability is good during the laying season of November to March.

EGG SIZE

The size of the eggs, birds lay, varies. Even in a single bird, the size of the eggs laid may also differ. But there is a standard size of eggs for each breed. Normal-sized (two ounce each) eggs always hatch better. Too small or too large eggs do not hatch well.

The shape of the egg has nothing to do with its hatchability, nor its colour. The width, length or shell thickness also do not



Set only the selected eggs for a good hatch

affect hatchability. However, eggs with sound shells hatch better than those with defective shells.

Candle eggs before hatching and reject those which are not of proper size and those which show defects, or meat or blood spots in them.

Since disease such as pullorum kills the developing embryo, better test the laying birds for such diseases, and get rid of those which carry the disease.

Fresh eggs or eggs stored in temperatures of 50° to 60° F for not more than a week give good hatching results.

And, while incubating eggs, see that you maintain the required temperature, humidity and ventilation, and turn the eggs at the right time. If you neglect these, even the best eggs from the best birds will hatch but poorly.

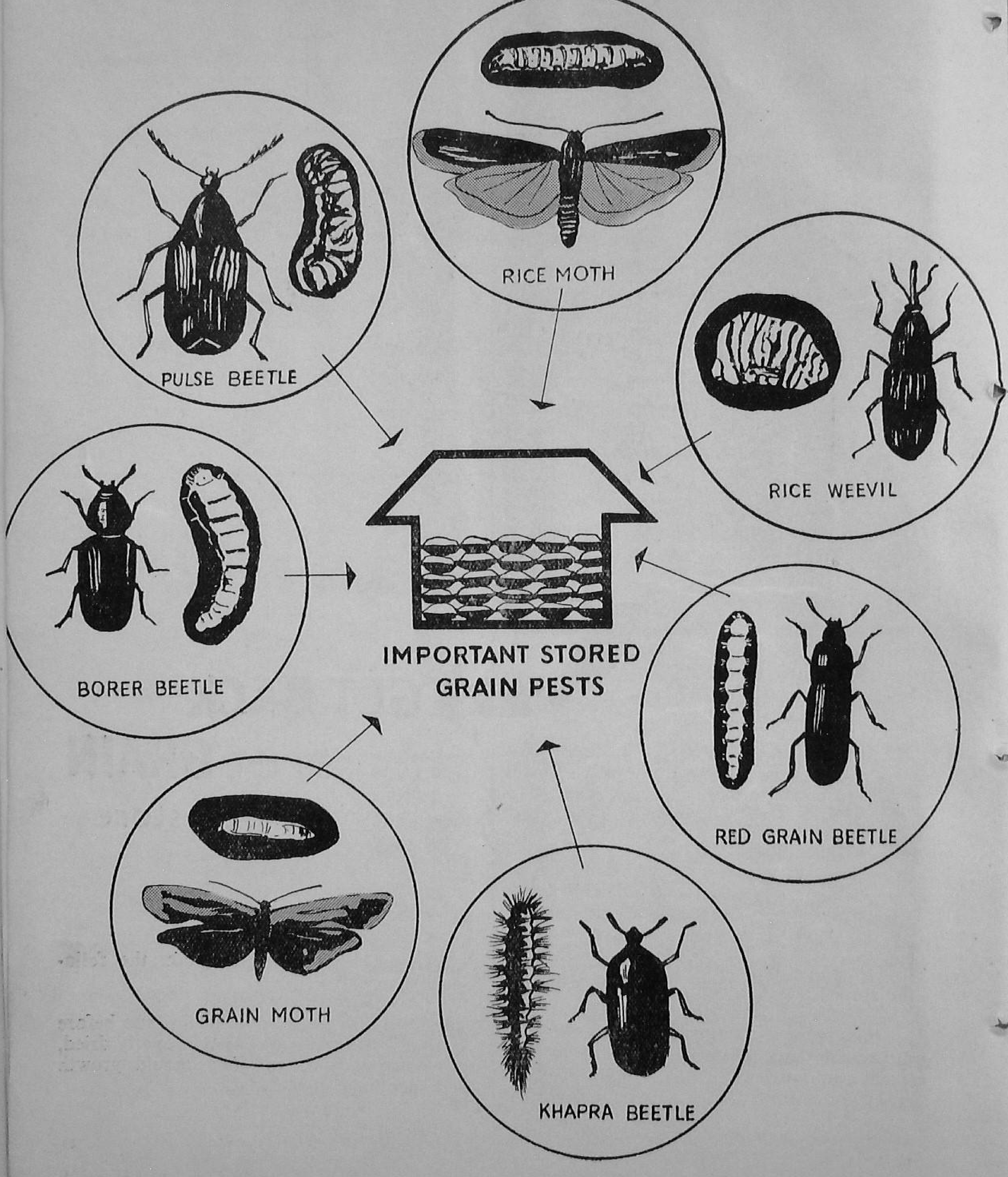
GET BACK all the GRAIN you store

Do you get back all the grain you put in the store ? Most people do not.

Insects, rats, dampness, change of temperatures destroy a part of it. Sometimes losses amount to 15 to 20 per cent of the grain you stored.

To get back all the grain, take the following steps :

- Dry the grain well in the sun before storing. If the grain is not properly dried, the moisture in it will help mould growth and encourage insect attack.


RICE MOTH
PULSE BEETLE
RICE WEEVIL
BORER BEETLE
IMPORTANT STORED GRAIN PESTS
RED GRAIN BEETLE
GRAIN MOTH
KHAPRA BEETLE

- After a thorough drying, put the grain in gunny bags, preferably new. If old bags have to be used, clean and disinfect them before you put the grain in. Old bags often carry pests.

- Clean the godown thoroughly —the walls, ceiling, floor, doors and windows. Collect the sweepings and screenings and destroy.

- Fill up cracks and crevices and rat holes by plastering. To plug the rat holes, first fill them up with broken glass pieces and close with cement.

- Fix six-inch wide tin sheets on the upper and lower six inches of the doors, windows and ventilators to safeguard against rat infestation.

- Better get the godown white-washed after cleaning.

- Spray the godown with two per cent DDT.

- Lay a suitable dunnage on the floor before stacking the grain bags to prevent damage due to moisture. A dunnage of straw (six-inch thick layer) or wooden planks will be good for bagged grains.

- Place the bags on the dunnage in a well-laid-out stacks. While stacking, leave sufficient space between the stacks and the walls. This will make moving the bags and checking up from time to time easy.

- After the bags have been stacked, dust five per cent BHC on the grain bags at eight ounce per 100 square feet of the stack surface.

Your job does not end here. Aerate the godown on dry days by opening the windows and ventilator. Inspect the godown every fortnight. In case you notice any insect pest in the bags or in the grain, arrange for the fumigation of godown. For this you need expert help. Ask your Gram Sevak how this can be arranged.

These steps will help you cut down storage losses, and get back all the grain you store.

FILMS ON LOAN

The Farm Information Unit of the Directorate of Extension has a library of films and filmstrips on agriculture and Home Science subjects. Membership is free. These films are given on loan, free of charge, to members of the library. For details regarding membership and films and filmstrips available, please write to the Librarian, Farm Information Unit, Directorate of Extension, Krishi Bhavan, New Delhi-2.

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and

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NEW DELHI

USE YOUR AUTUMN POTATOES FOR SPRING PLANTING

EACH spring, potato-growers have to spend a lot of money to get seed from the hills for sowing.

This is because they cannot use the tubers from autumn crop, as the fresh tubers do not make good seeds. These tubers have to be given a rest for some months before they can germinate properly.

Recent investigations, however, have shown that the fresh tubers from any local variety can give good germination, provided you treat them with a one per cent solution of thiourea before planting. Such a treatment will break the dormancy in the freshly-harvested tubers and make the buds active. Result ? They will germinate satisfactorily when sown.

You can get the chemical from the Agricultural Department. It costs about seven to eight rupees a pound. And you don't need more than two pounds for treating seeds for planting an acre.

To prepare the solution, dissolve one part of the chemical in a hundred parts of water in a bucket or tub.

Before treating the tubers in this solution, wash them to remove the mud sticking to them. Then dry by spreading them thinly on a sand layer. Cut the tubers into seed pieces ; each piece must have one or two eyes and weigh 1/4 to an ounce. If you are using whole tubers, make two or three shallow cuts on the tubers.

Soak these pieces or whole tubers in the solution you have prepared for an hour. Don't remove the seed pieces with your hands. Instead, pour the solution (along with the seed) through a hessian cloth having wide meshes into a bucket. Remove the tuber pieces and use the solution again.

Better plant the tubers in the moist soil immediately after treating. If, however, planting has to be delayed for some reason, spread the treated pieces thinly in the shade to let the surface dry. And, don't delay the planting time more than what it is absolutely necessary.

So this time, use your autumn potato seed for the spring crop and see how much money you can save, compared to what you spend when you buy seeds from the hills.

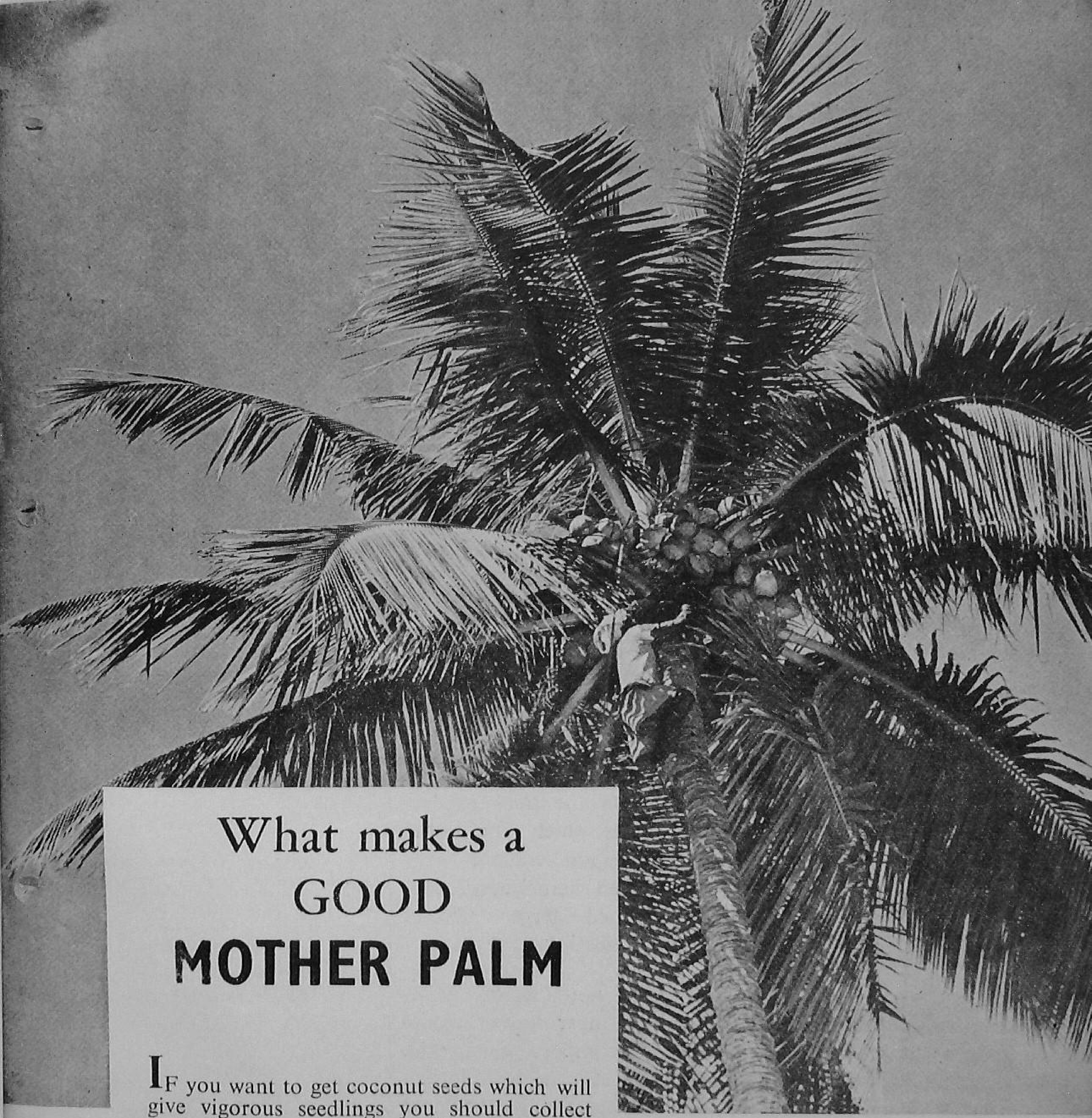
The Kerala Farmers'

FERTILIZER GUIDE

HERE IS A GUIDE THAT GIVES THE KERALA FARMER AT A GLANCE WHAT AND HOW MUCH OF FERTILIZERS TO USE FOR IMPORTANT CROPS HE RAISES

Crop and Soil	*Dose in pounds per acre* Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	*Mixture grade* Nitrogen (N) : Phosphoric acid (P_2O_5) : Potash (K_2O). Figures in brackets show the percentage of water soluble phosphoric acid
RICE The three rice crops raised in the State are : *Viruppu* or first crop (April-May to August-September) *Mundakan* or second crop (September-October to January-February) *Punja* or third crop (December-January to March-April)				
Sandy soils and sandy loam soils				
(First crop or *Viruppu*)	20	20	20	
Basal dressing	10	20	20	
Top dressing	10	—	—	9 : 9 (4.5) : 9
(Second crop or *Mundakan*)	30	30	30	
Basal dressing	15	30	30	
Top-dressing	15	—	—	5 : 10 (5) : 10

Clay loam soils				
(Kuttanad and similar areas)	30	40	20	
(Third crop or *Punja*)	20	40	20	
Top-dressing	10	—	—	7 : 14 : 7
Laterite soils				
(First crop or *Viruppu*)	30	30	30	
Basal dressing	15	30	30	
Top dressing	15	—	—	5 : 10 (5) : 10
(Second crop or *Mundakan*)	40	30	30	
Basal dressing	30	30	30	
Top-dressing	10	—	—	9 : 9 (4.5) : 9
COCONUT (per tree)				
Sandy (sandy loam soils)	0.5	0.5	1.0	
Laterite soils	0.5	0.5	1.0	
Clay loam (Kuttand and similar areas)	0.5	0.5	1.0	8 : 8 : 16
TAPIOCA	50	50	100	8 : 8 (3) : 16
BANANA (per plant)	0.5	0.5	0.5	9 : 9 (4.5) : 9
GINGER	50	50	100	8 : 4 (4) : 16
PINEAPPLE	100	50	200	8 : 4 (4) : 16
ARECANUT	50	25	100	8 : 4 (4) : 16
SUGARCANE				
Factory areas of Thiruvalla and Pandalam	100	80	100	9 : 7 (3) : 9
Other areas	150	75	75	12 : 6 (3) : 6
PEPPER (per standard)	0.2	0.3	0.15	7 : 10 (5) : 5
GROUNDNUT	10	30	30	3 : 9 (9) : 9
CARDAMOM	40	40	40	9 : 9 (4.5) : 9
COTTON				
Irrigated	40	40	40	9 : 9 (4.5) :9
Rainfed	20	20	20	
Sea Island	40	30	50	8 : 6 (3) : 10



What makes a GOOD MOTHER PALM

IF you want to get coconut seeds which will give vigorous seedlings you should collect them from good mother palms only. The mother palms you select should be healthy, middle-aged and good bearers. It is better to select them from rain-fed gardens which have a large number of such trees.

Here are the things you should look for in a good mother palm.

One. The palm you select should bear regularly as well as heavily. It should give

about 100 nuts or at least 80 a year. If you count all the nuts on the tree for wot years you will know its yielding capacity. Also, a high-yielding mother palm will always have 30 or more fully opened leaves in its crown. Usually, a large number of leaves in the crown and bunches having many developing nuts are considered to be the sign of a high yielder.

Two. Examine the characteristics of the leaves. The leaves of a good palm should have short and thick petioles, a wide leaf base and be firmly attached to the stem. The disposition of the leaves in the crown should be such that they can provide support to the developing bunches.

Three. If the palm is a good one, it should produce inflorescences in every leaf axil and have a good number of female flowers in them. There should be, at any time, at least 12 bunches having nuts at different stages of development on the crown. The bunch stalk should be short, thick and strong, and not thin, long or showing the sign of bunching or drooping down.

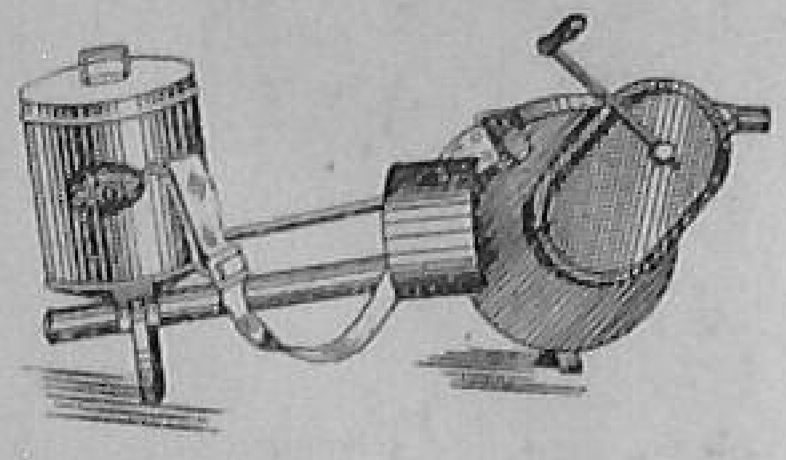
Four. The size and shape of the nuts the mother palm bears is also important. Better select palms which bear medium-sized, round or oblong nuts. Such trees have been found to yield high and generally give nuts containing more copra. Such nuts also germinate better. Avoid those trees which bear long, narrow and bigger or smaller-sized nuts than normal. If, however, you are growing husked coconuts, select trees that yield big-sized nuts having thick kernel in them.

In case, you cannot mark out all the mother palms you want having all the good points, see that at least they yield a large number of good quality nuts which are free from defects.

Reject the trees producing nuts which are empty or do not contain well-developed kernel inside, also which shed a large number of undeveloped nuts.

Do not select palms growing near houses, cattle-sheds, compost pits, tank bunds, etc., as it will then be difficult for you to know whether the palms are really good ones or are producing well just because of favourable conditions.

BEST INDIAN MAKE
DUSTERS & SPRAYERS



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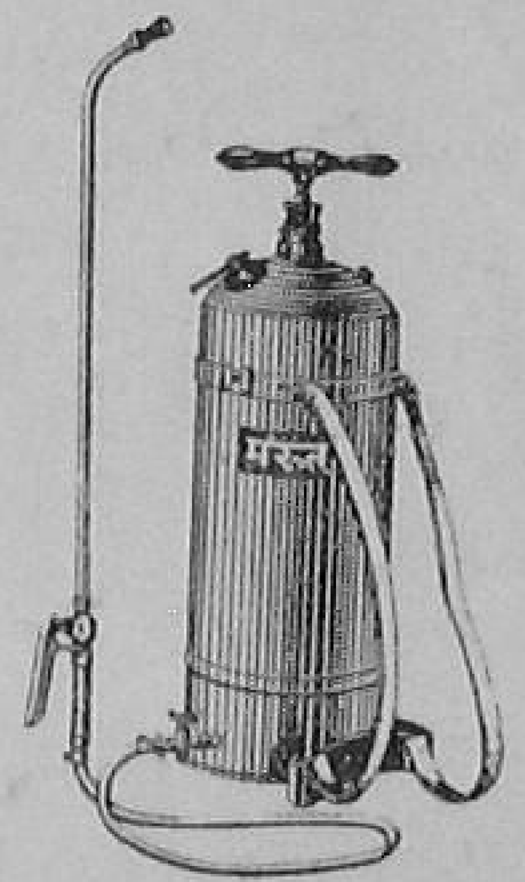

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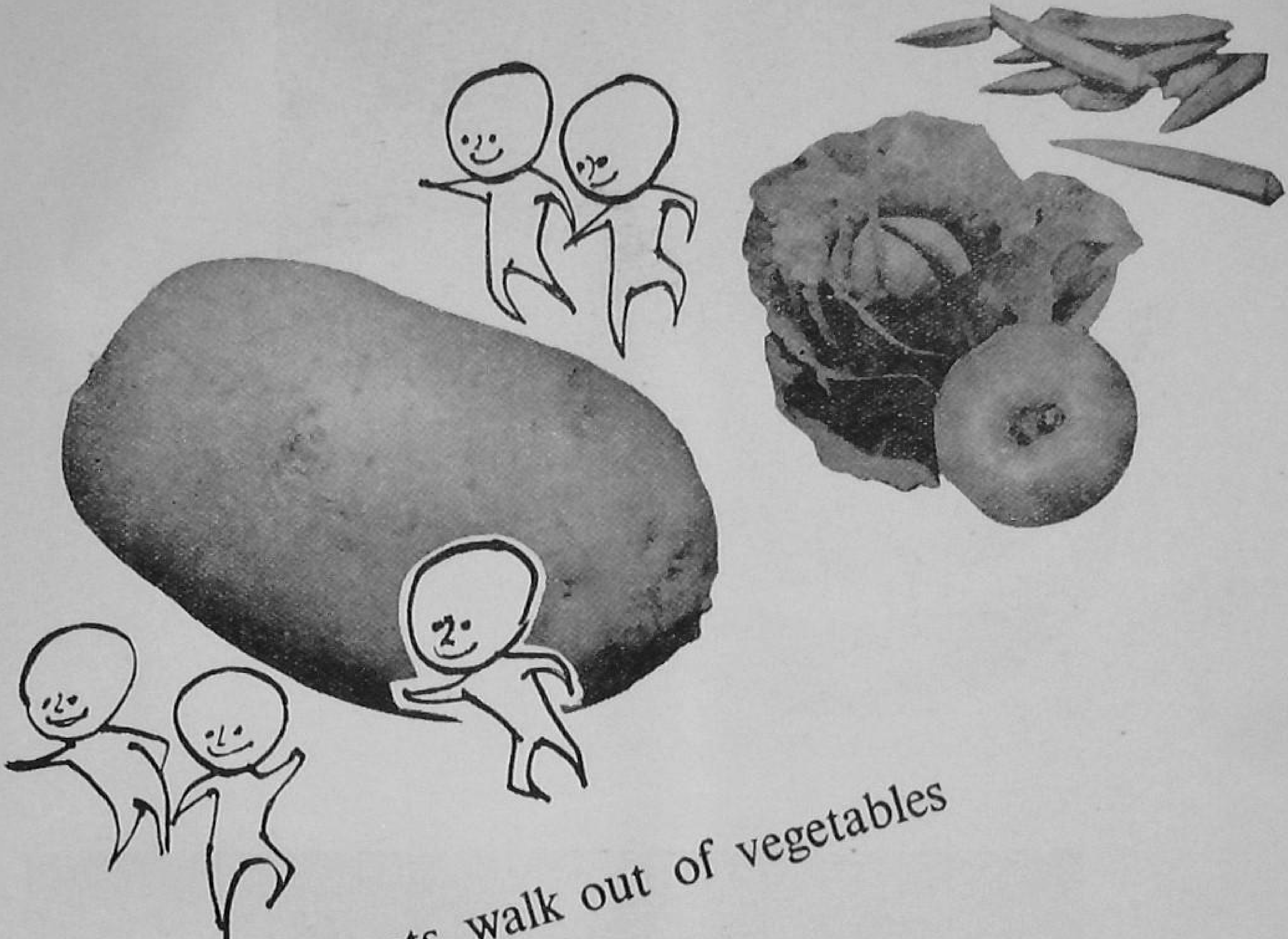


Don't let Nutrients walk out of vegetables

By KAMLESH PURI

IF you want to get good nutrition from vegetables, you should not allow the nutrients in them to 'walk away.'

Vegetables are an important food. They contain vitamins and minerals, but these are lost when vegetables are washed in water and not cooked in a proper way.

When you expose the cut surface of the vegetables to water, a great amount of vitamins and mineral salts get into the water and are lost.

Therefore, make it a practice to cook vegetables in their jacket, when you are not using the water for any other preparation. The outer skin prevents the nutrients from dissolving in the water.

Of course, you have to wash vegetables even when they are from your backyard. This you do to wash away the dirt or germs. When there is an epidemic or disease, wash them in potassium permanganate (pinkie).

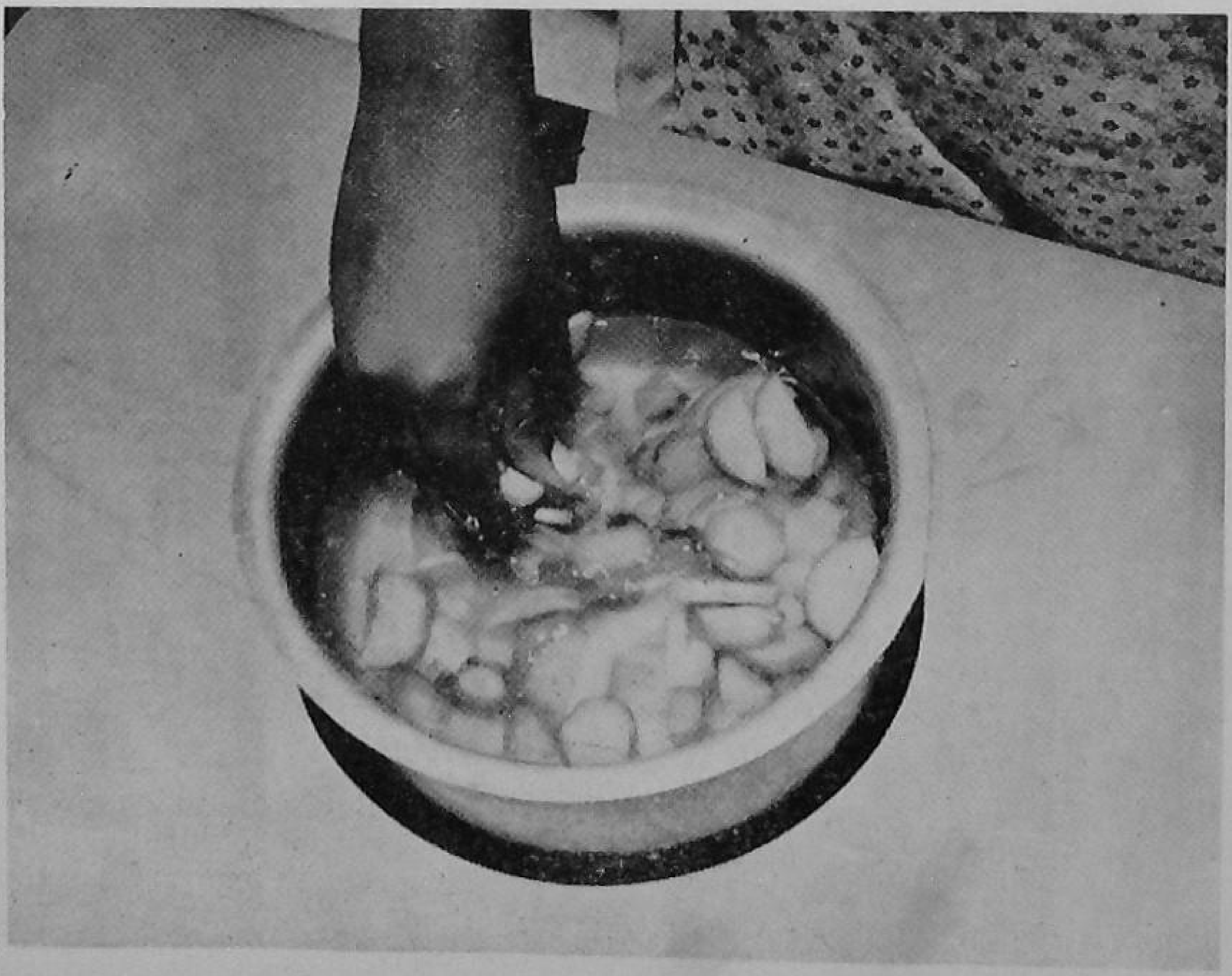
Here is the right way of preparing the vegetables :

Number one rule is to prepare vegetables just before cooking. Don't let the cut surface remain exposed to the air for a long time.

Wash vegetables thoroughly in cold water.

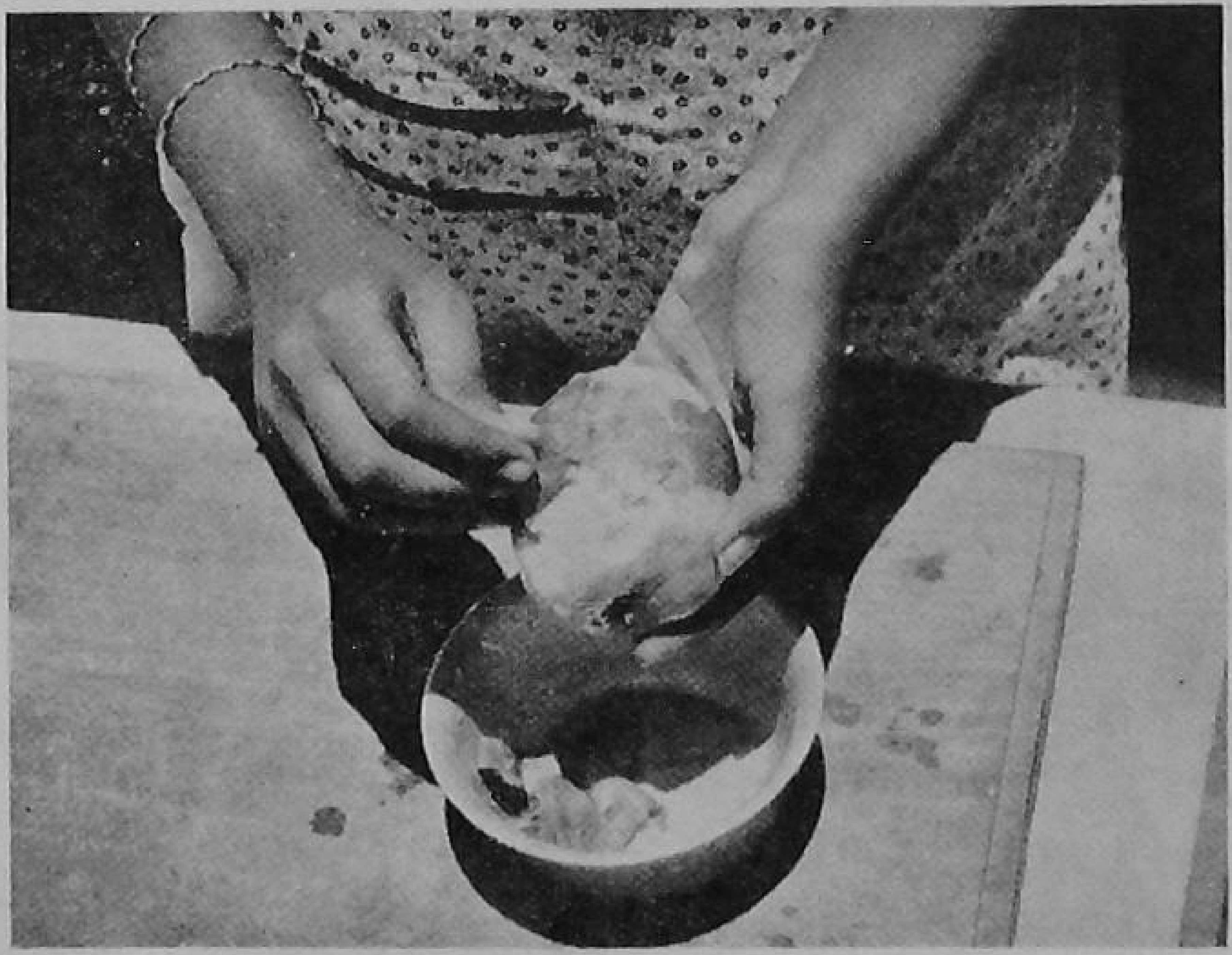
Never wash them after they have been cut.

Wash vegetables you must. But wash them only before cutting them...



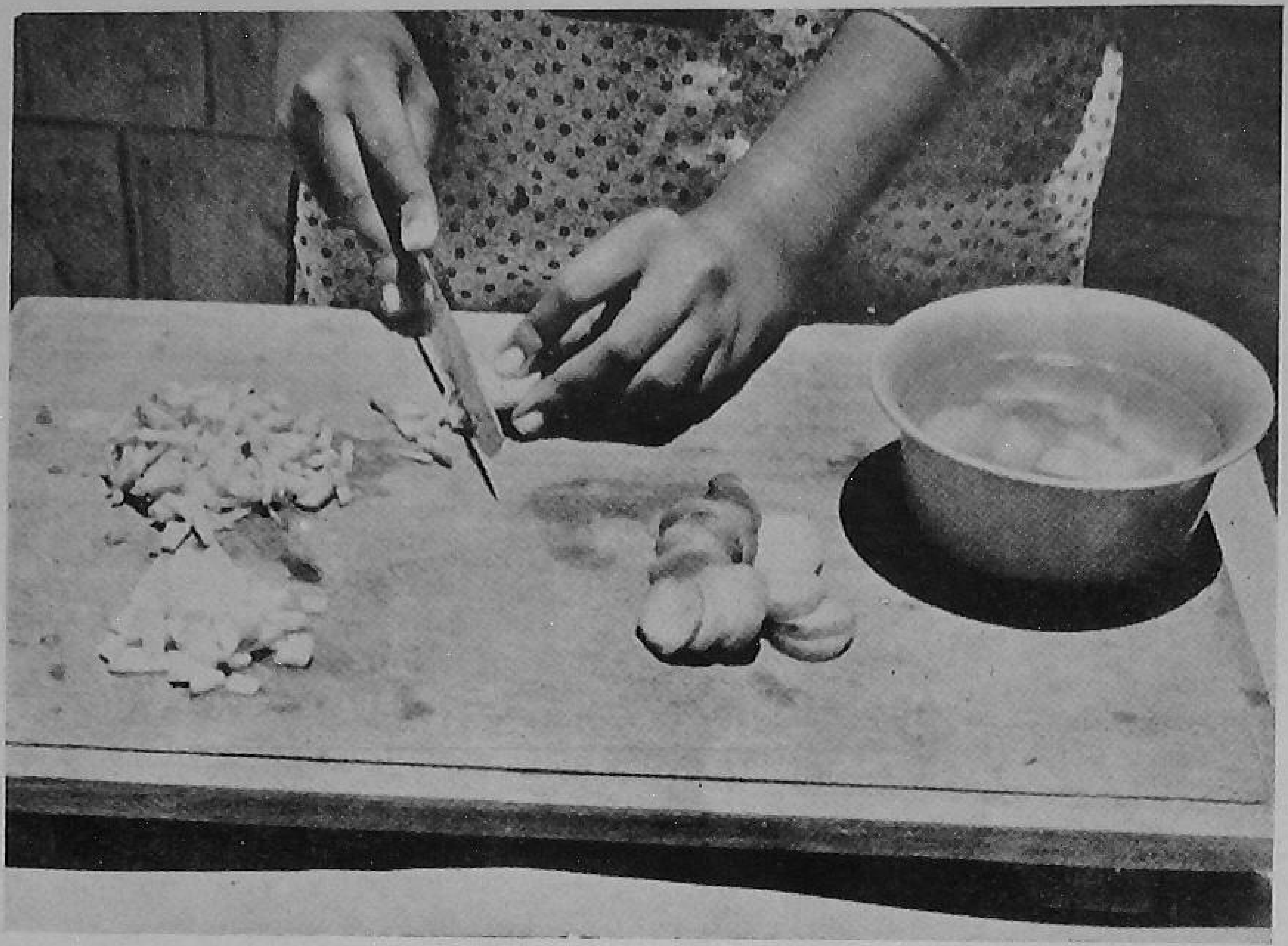
...and not after you have cut them

Pair vegetables very thinly

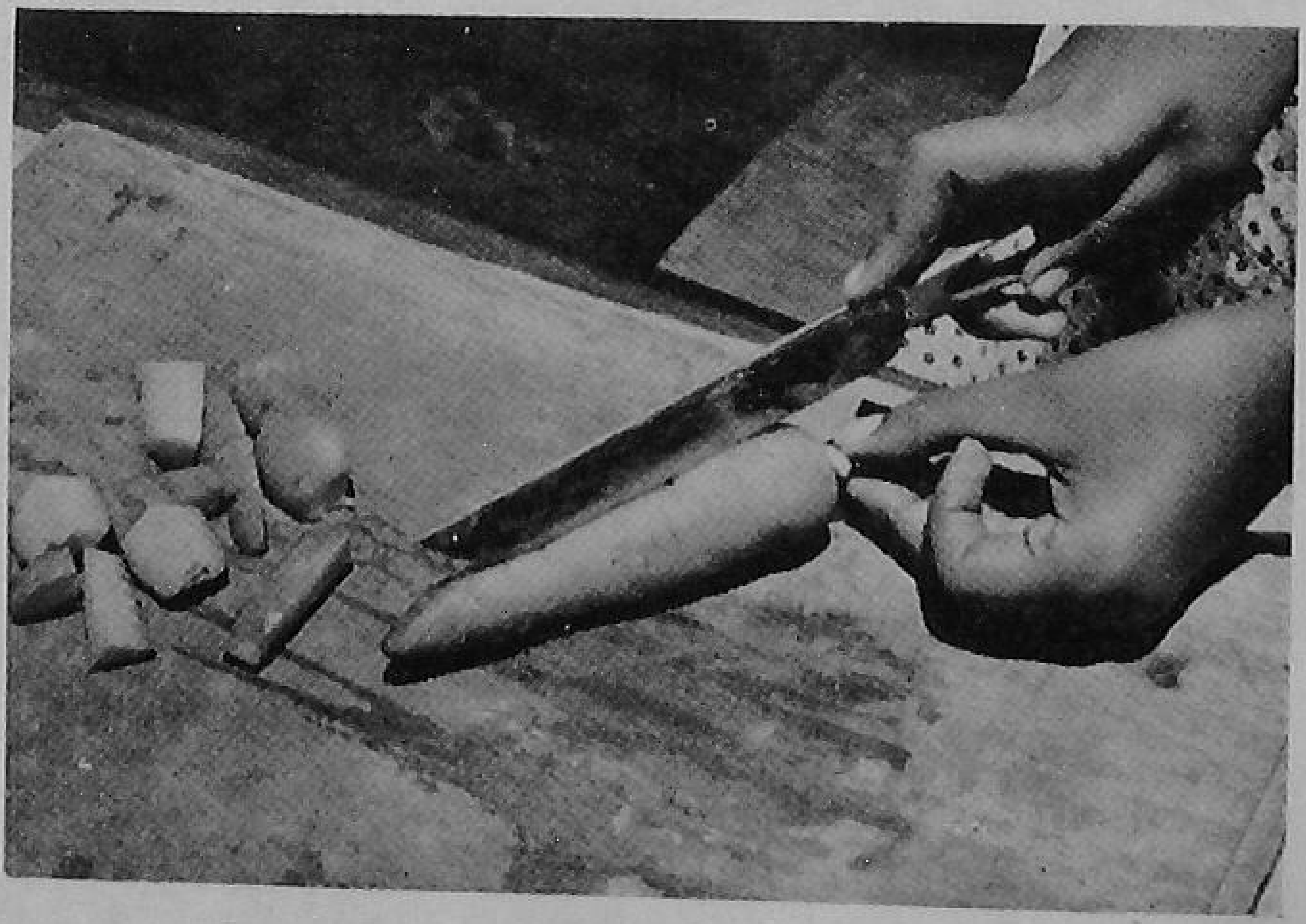


Peel potatoes, arbi, *etc., after boiling*

Never remove a thick peeling



Better cut the vegetables on a chopping board



Cut with the knife blade pointing away from you

Pair vegetables very thinly—if they need paring.

Peel vegetables like potatoes, sweet potatoes, *arbi*, yam, peas after boiling.

Never remove a thick peeling.

Cut vegetables on a chopping board. Hold the vegetables in your left hand. Cut with the knife blade pointing away from you. Otherwise, you run the risk of cutting your hand or finger.

Place the cut pieces in salt water. This way vegetables won't become dark.

Cook your vegetables immediately. Don't cook for a long time.

With this much of care, you have the nutrients intact.

The help rendered by the Principal, Shri Avinashlingam Home Science College, Coimbatore, in preparing the article is gratefully acknowledged.

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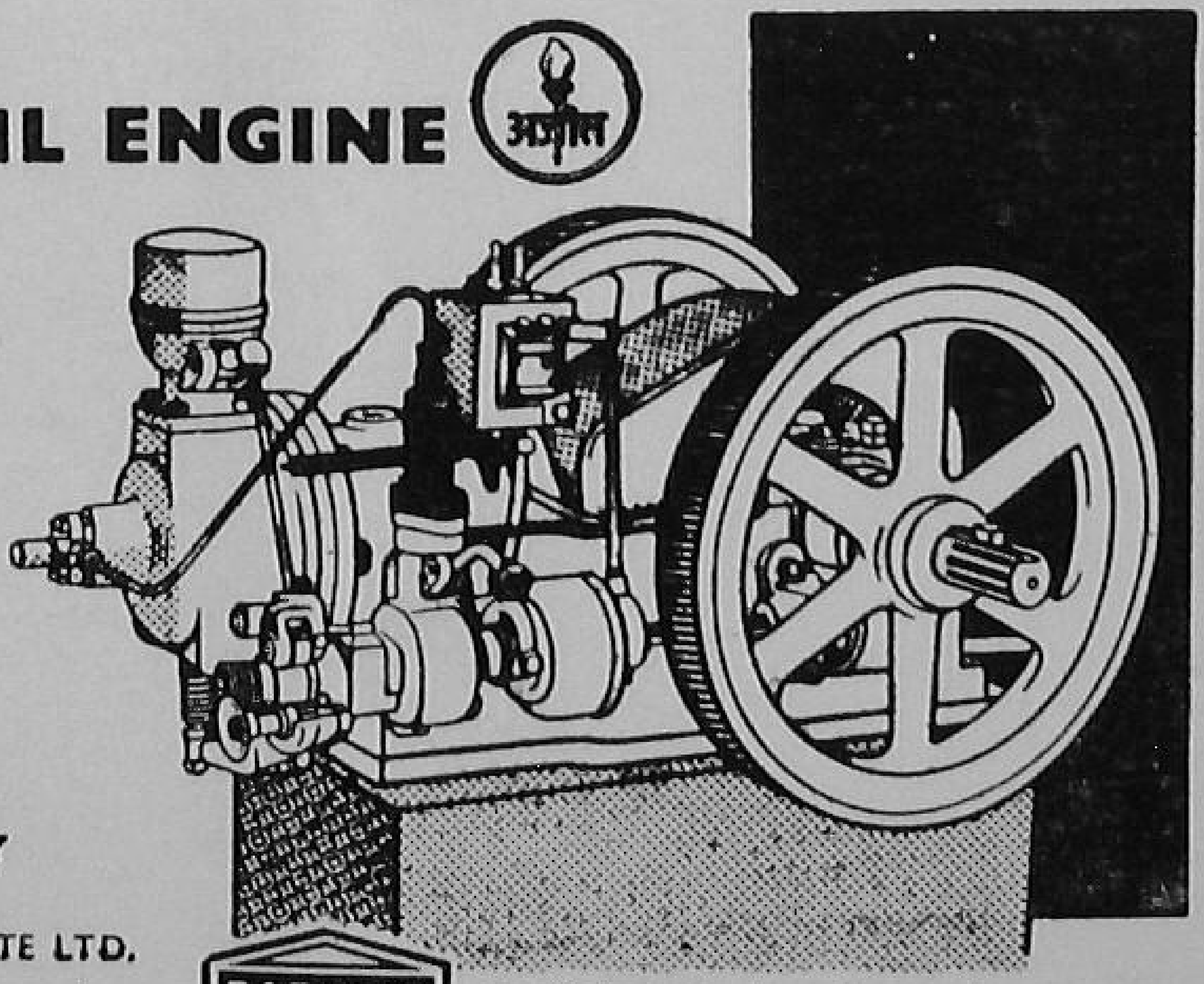

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Five fodder grasses that you can grow

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How to use fertilizers
Facts about fertilizers
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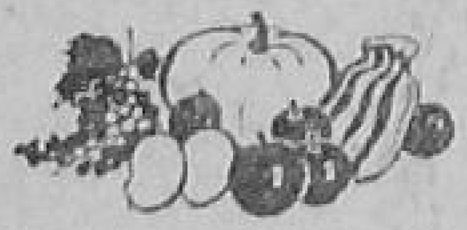

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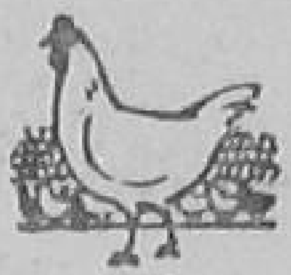
Papaya is easy to grow
Drumstick, the year-round vegetable
Growing grapes in south India
Rabi vegetables—grow them this way
How to grow paying pineapples



POULTRY

How to fight coccidiosis in poultry
Protect your poultry birds against Ranikhet
Save your fowls from tick fever
Fighting fowl pox in poultry
How do you transport your poultry birds ?
Watch out for pullorum
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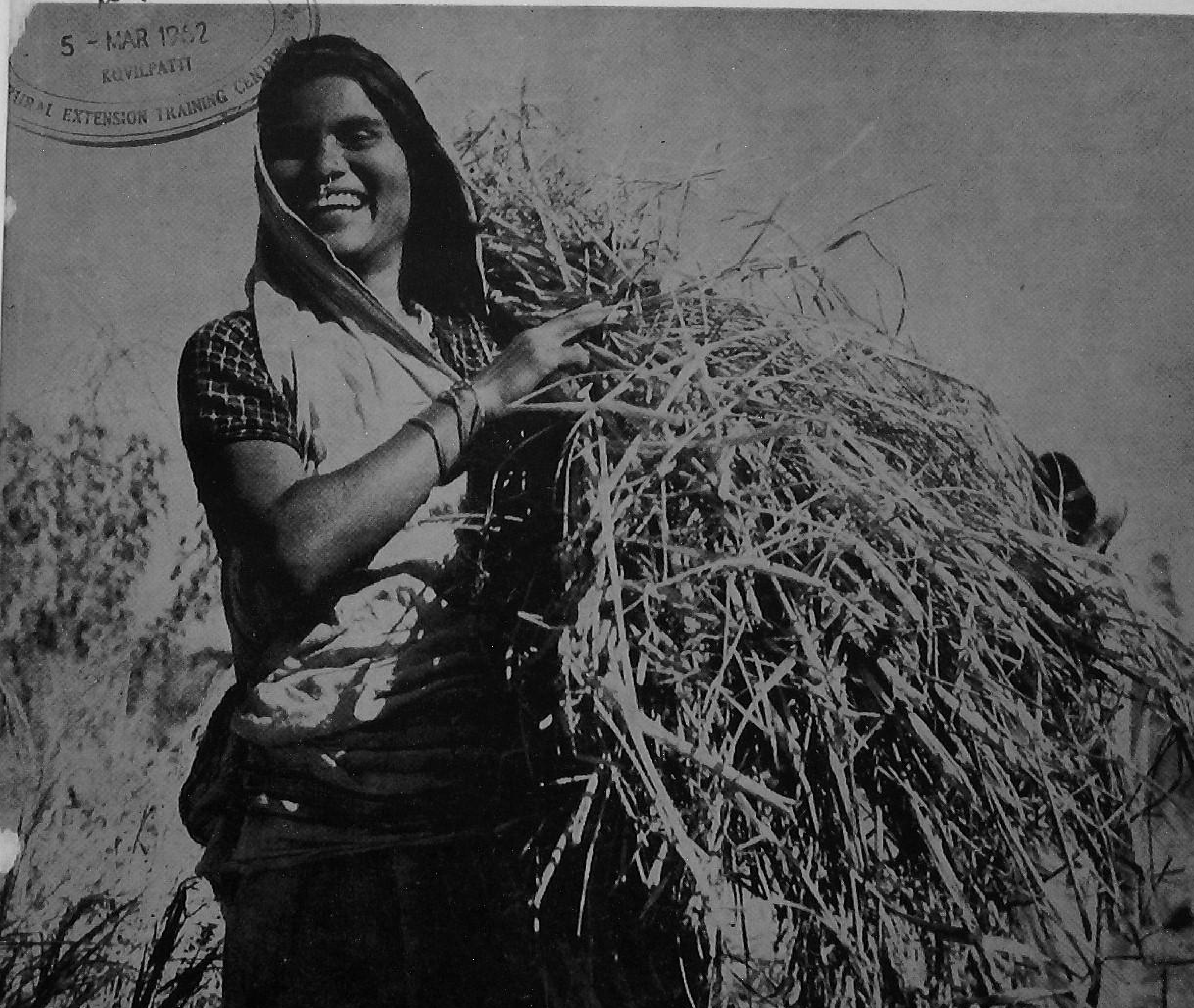

HE FARM AND FARM HOME MAGAZINE February, 1962

THE PICTURE ON THE COVER *With a bumper harvest of paddy, this farm woman from West Godavari District in Andhra Pradesh greets her future with a radiant smile.*

—Photo by Rajinder Paul

EXTENSION

THE FARM AND FARM HOME MAGAZINE

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NEW

POTATOES

THAT YIELD WELL

By T. R. MEHTA

TWO varieties of potato, among many tried at the Central Research Institute, Gwalior, show that it is more profitable to grow them in place of others.

The Departments of Agriculture in each state are popularizing these improved varieties evolved by research on potato.

At Gwalior, about 50 varieties were tried to see which ones among them would be best for farmers to grow in the area. Among these varieties, *P.S. 194* and *P.S. 196* were found to be the best.

These new varieties, which were also tried by a few farmers in the villages near Gwalior and some of the potato-growing villages of the Punjab, were found to be excellent in yield. They were also found to have another important trait—they keep their high-yielding character intact even if you grow the variety year after year unlike other varieties which degenerate quickly.

Normally, when a farmer finds the potato seed going down in its yield-capacity, he has to obtain fresh seed raised in disease-free area and where seed is multiplied by experienced growers with the techniques which ordinary farmers do not know. Hence, the seed is costly and difficult to obtain. With *P.S. 194* and *P.S. 196* the farmers now need not go in for fresh seed every few years. Thus they will be able to reduce the expenses on seed.

How much better these two varieties can yield has been seen in the fields of Shri R. N. Sharma, a keen potato farmer of Gwalior. This potato farmer who has 300 acres under potato was till 1959 growing *Up-to-date* or (*Military Special*), *Satha* and *O.N. 2236*. This farmer was given a small quantity of the seed of the two new varieties sufficient for sowing two acres in 1959-60. Both the varieties did very well in that year and the farmer utilized the yield to put 15 acres under these varieties in the following year. Shri Sharma harvested a part of his crop early to supply the market with potatoes, when prices were high. The following yields per acre were taken of the crop that was allowed to mature fully and was in the field for 4 to 4½ months.

This luxuriant crop of P.S. 196 *yielded as many as 340 maunds of potato*

A plant of P.S. 196 *harvested 60 days after sowing*

Variety	*Yield per acre* (maunds)
Up-to-date	173
O.N. 2236	214
Satha	204
P.S. 194	398
P.S. 196	340

P.S. 194 and *P.S. 196* thus gave him very high yields compared to the other varieties. Of these two, *P.S. 196* is suited as an alternate to *Up-to-date* or *O.N. 2236*, because it forms tubers early and can yield 125 to 150 maunds of tubers of a salable size, 60 days after sowing. Within this period *Up-to-date* and *O.N. 2236* will not be able to give more than 80 to 100 maunds. Besides, these varieties get early blight attack and as a result produce a lower yield if allowed to grow to maturity.

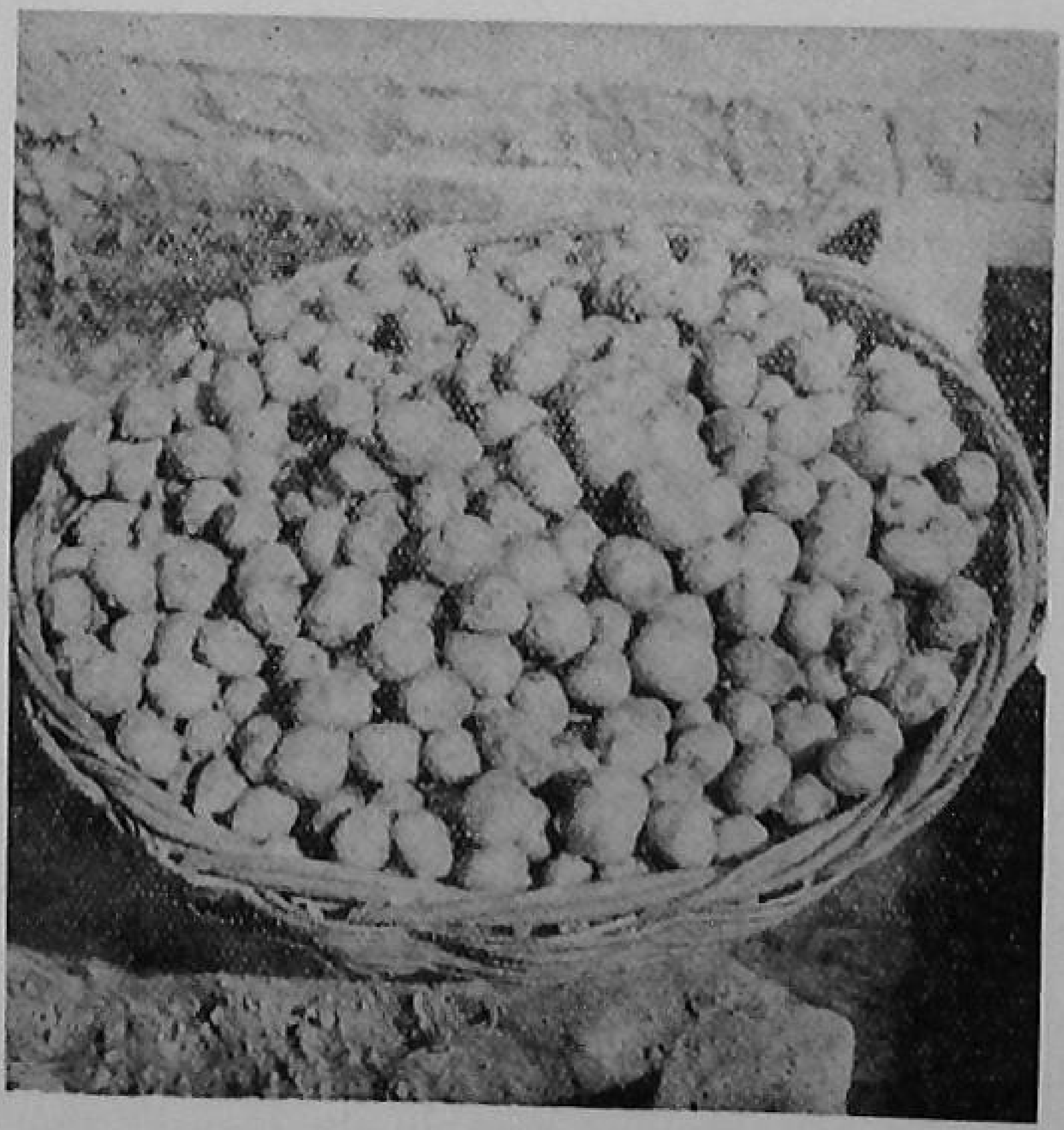
P.S. 194 is a medium early variety and can easily replace *Satha*, *Phulwa* and *Darjeeling Red Round* as the main season crop.

This year, Shri Sharma is planting the two varieties in 230 acres of the total of 300. He will be replacing the old varieties, including his favourite *Satha* with the new ones. He will also be trying another four new varieties *P.S. 416*, *P.S. 444*, *P.S. 529* and *P.S. 763*.

With these new varieties, Sharma expects his per-acre profit to go up to 600 to 700 rupees, which means an additional profit of about two lakhs per year. With this increase in profit, he will be investing a few lakhs on the expansion of his cold store and will help other farmers obtain good seed.

High-yielding potato varieties are a real gift to farmers. They should now take to growing these improved varieties without any hesitation.

Harvested tubers from the variety P. S. 196



BETTER FARMING TIPS

BETTER ARECA SEED

EVERY arecanut grower would like to have well-grown seedlings for planting. They can get such seedlings only when they sow good-sized heavy nuts.

In every bunch of arecanuts that the grower uses for sowing, not all the nuts are of the desired size for sowing. It is seen that only three-fourths of them are heavy and good and the rest are small in size and lighter in weight.

Sowing the good-sized heavy nuts will give good and robust seedlings for planting. Such nuts germinate early and grow up with more leaves. The number of seedlings suitable for planting are more, for you can get more suitable seedlings from such nuts.

Hence, make it a rule to sow only the heavier nuts.

INCREASING MOTIHARI YIELD

LATEST experiments point out the cultural practices that will fetch a better return from Motihari tobacco.

Research shows that the crop is best planted in the second week of November. This planting time gives better results than earlier or later plantings.

A closer spacing of 2 feet by 1½ feet is better than a wider spacing of 2 feet by 2 feet which farmers follow. Such a spacing in the experiment resulted in about 14 per cent higher yield.

So far as topping is concerned higher topping increases the yield, but topping higher than six leaves results in a low quality leaf.

WILT IN ARECANUT NURSERIES

WILT, the disease which appears in arecanut nurseries, can be controlled with any of these two chemicals : Ceresan wet (Bayer) and Leytosol.

Wilt is a fungus disease. The fungus gets into the seedlings through the roots. When there is an attack, the seedlings start wilting, and finally dry out.

The only method that can prevent this attack is to drench the soil with an effective fungicide. This should be done before the nursery beds are sown. A 0.10 per cent solution of Ceresan or Leytosol at one pound in 150 gallons of water can be used for the purpose.

If the seedlings are already affected, pull them out and destroy them.

MILDEW DISEASE OF CUMIN

APPLYING sulphur dust to the cumin crop has been found to check the attack of powdery mildew.

Powdery mildew is a disease which causes heavy lossess of cumin crop in Rajasthan.

The disease appears as greyish spots on the lower leaves during the months of January and February; soon these spots become larger and the leaf is covered with a powdery material (spores). In course of time, stems also get covered with such powdery material.

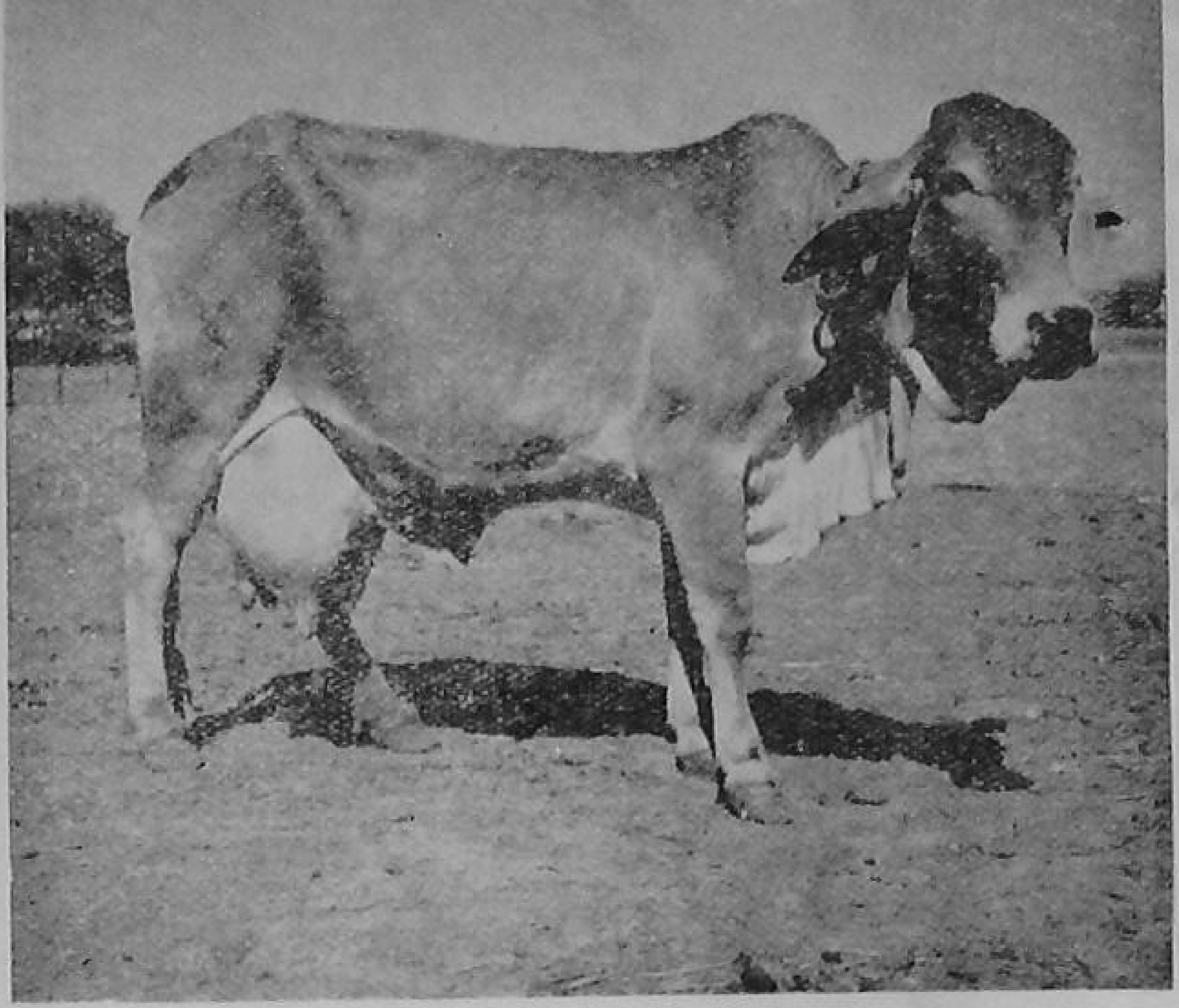
When the attack is severe, stems, flowers and fruits all are affected, so much so that the fruits do not mature, but become lighter in weight. The yield goes down.

Farmers are advised to dust finely-powdered sulphur dust at the rate of 25 pounds per acre once, and if the attack is serious, twice on the crop.

Mastitis

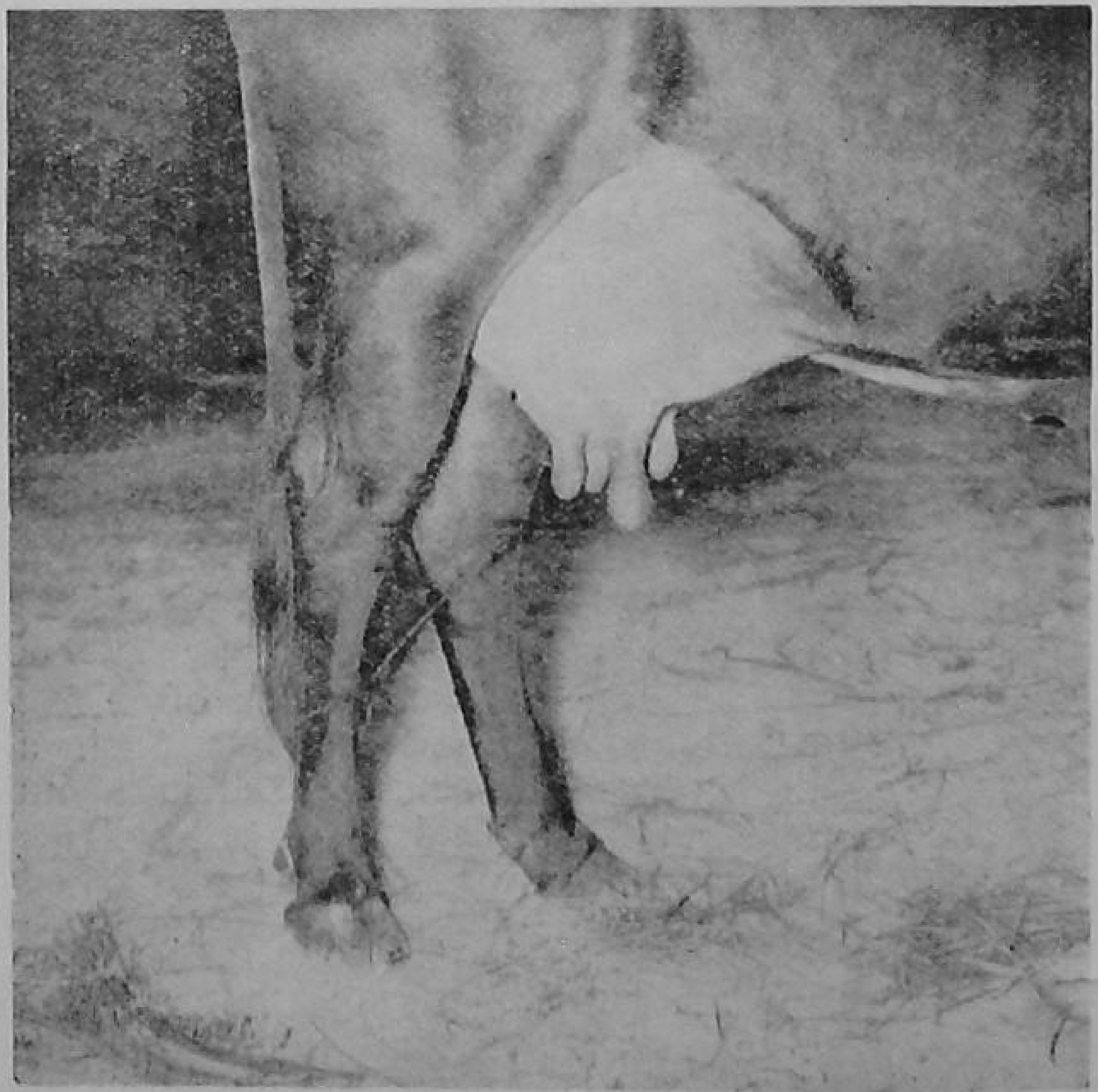
IN YOUR HERD?

By O. P. MALHOTRA



A mastitis-affected animal—have it immediately treated if your herd has any

The disease can be detected when the teat of the udder stands out hard and shining



NO one can definitely say the exact number of dairy animals that suffer from mastitis each year in our country. But all agree that this number is pretty high.

Mastitis, the disease of the udder of the milch animals, not only makes the animal unprofitable to keep but also makes it a source from which other animals get the disease.

When mastitis occurs, the udder gets swollen. One, two or all the teats of the udder may be affected at one time.

CAUSES THAT LEAD TO MASTITIS

The disease is caused by germs. Poor management, wrong methods of milking, poor feeding and unhealthy conditions make it easy for mastitis germs to attack the animal.

The germs find it easy to enter an udder which is bruised or injured due to other cows treading on it, or by being kicked by another animal or due to such causes as lying down on hard grounds, crossing a barbed wire fence, thorns in the pasture or stumps in the cattle-shed.

The germs get into the teat from the floor where an affected animal has been tied, from dirty water, infected hands of a milker or the discharge from an infected animal.

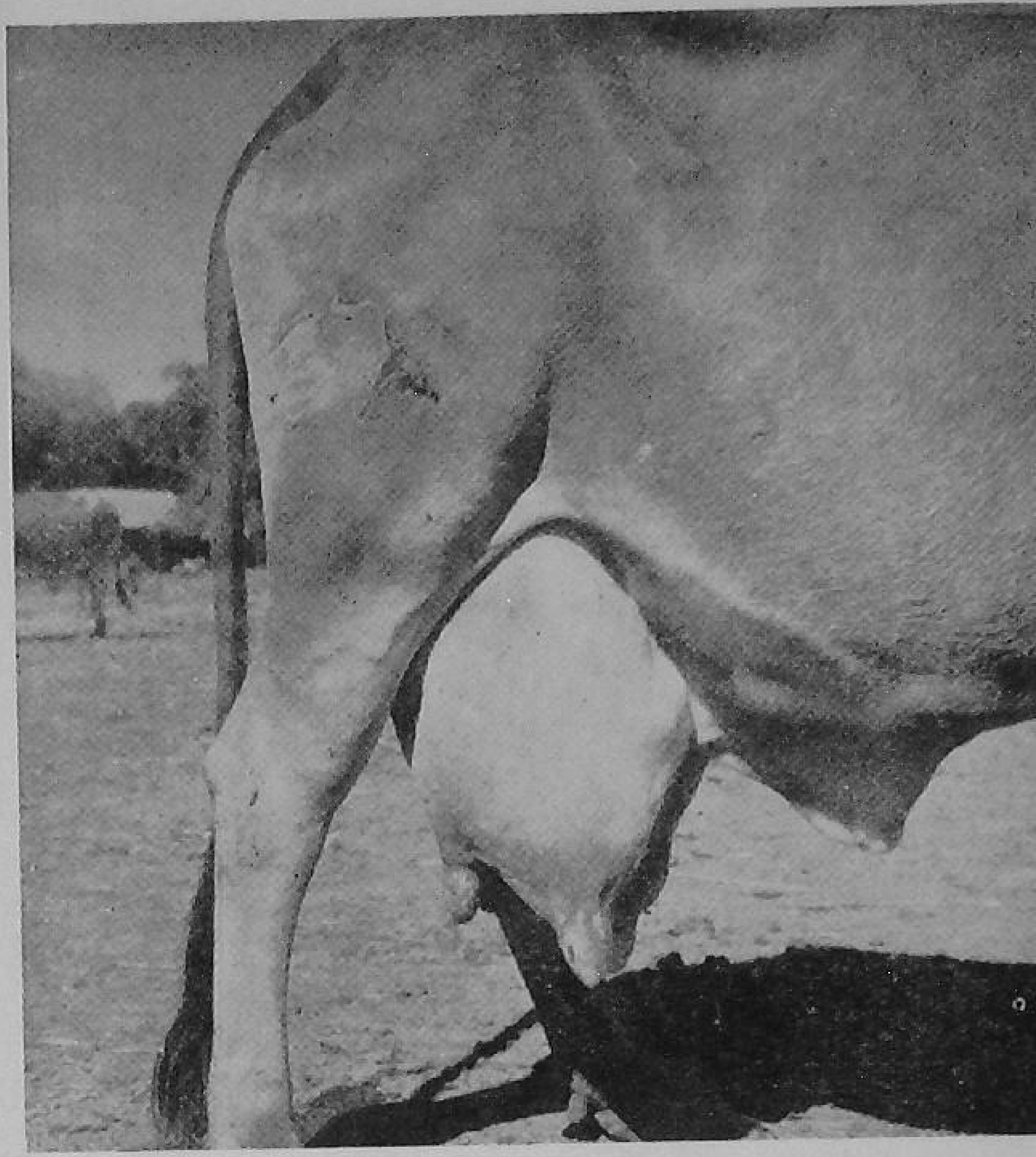
If there is one common cause for the animal to get mastitis, it is the incomplete milking of the udder. Wrong methods of milking and allowing the animal to be on a damp floor, wet pastures and stagnant drinking water are the other easy ways for an animal to get the disease.

SYMPTOMS

You can detect mastitis in animal when you find one teat of the udder hot, hard, shining and sensitive to the touch. When you draw milk, you will find it yellowish and whey-like with a little curd in it. Later, milk becomes scanty and you will find clots in it. As the disease advances, there will be no more milk, but a blood-tinged and watery discharge coming out of the udder. The animal may get fever and also lose appetite.

PREVENTION AND CONTROL

You can easily prevent mastitis by putting in a little extra care in managing your milch animals.

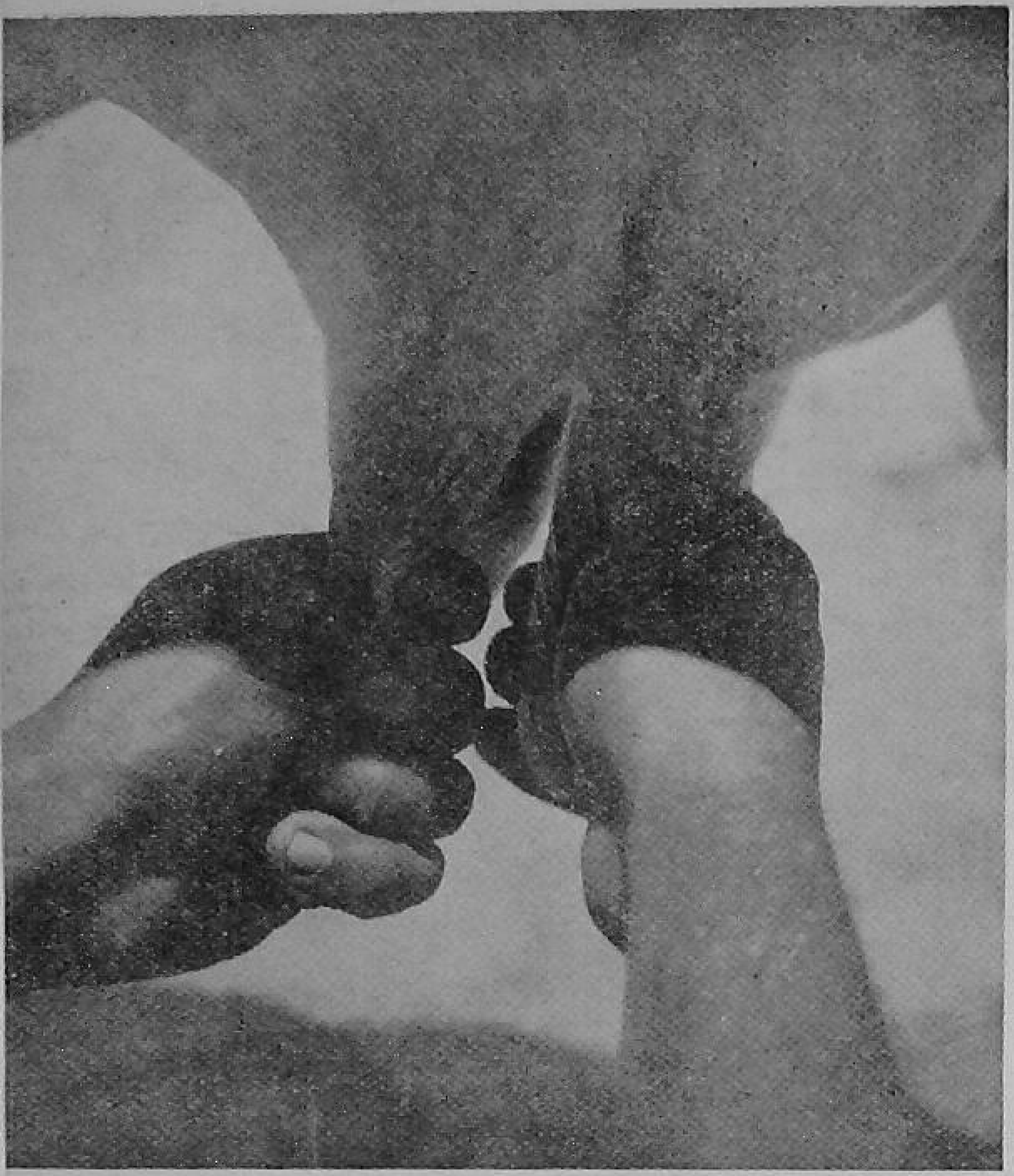


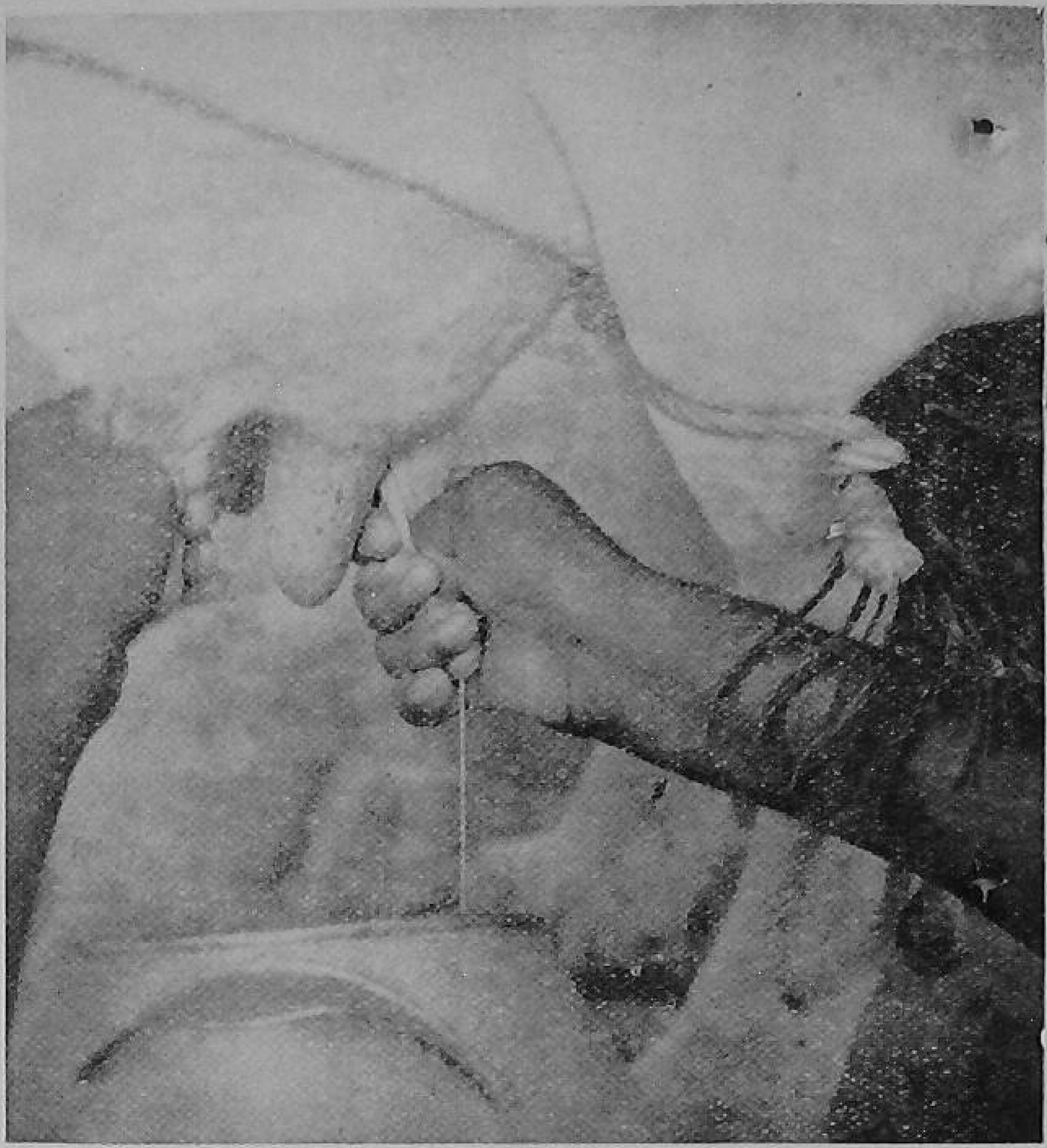
One, two or all the teats may be affected at one time

As soon as you see any udder injuries, have them immediately treated.

See that the stalls are properly constructed with enough space for each animal. To prevent one animal treading on another or butting it, have partitions. Provide a dry and soft bedding. See also that the floor is kept dry.

Have your milking done according to a plan. Animals get used to this routine. Clean the udder well before milking. A good method to do this would be to put a duster in a warm water bucket. Add any disinfectant to the water, if you can. Take out the duster from the water, wring it out and clean the udder of the animal well. Let the teats be dry. Then start milking.



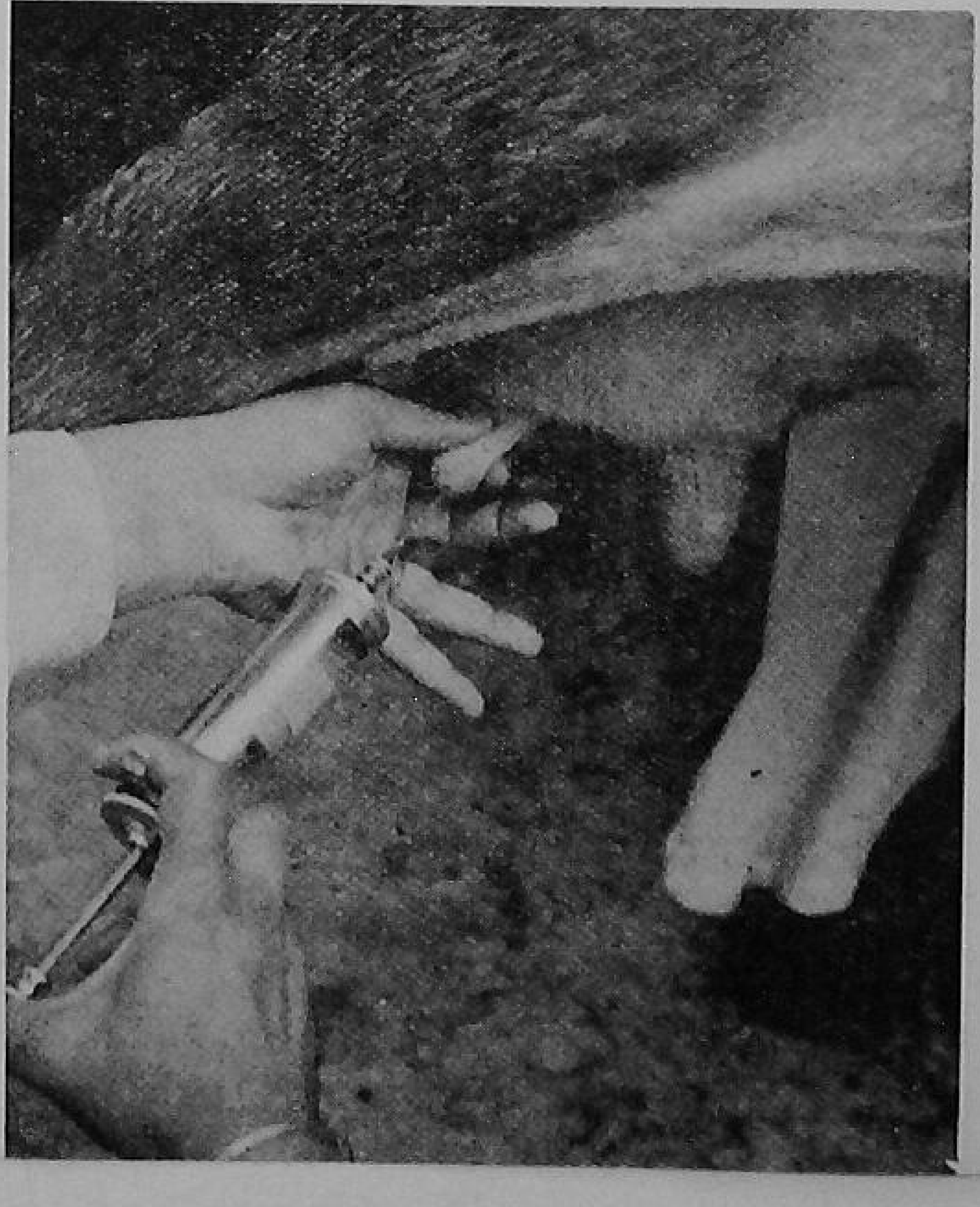


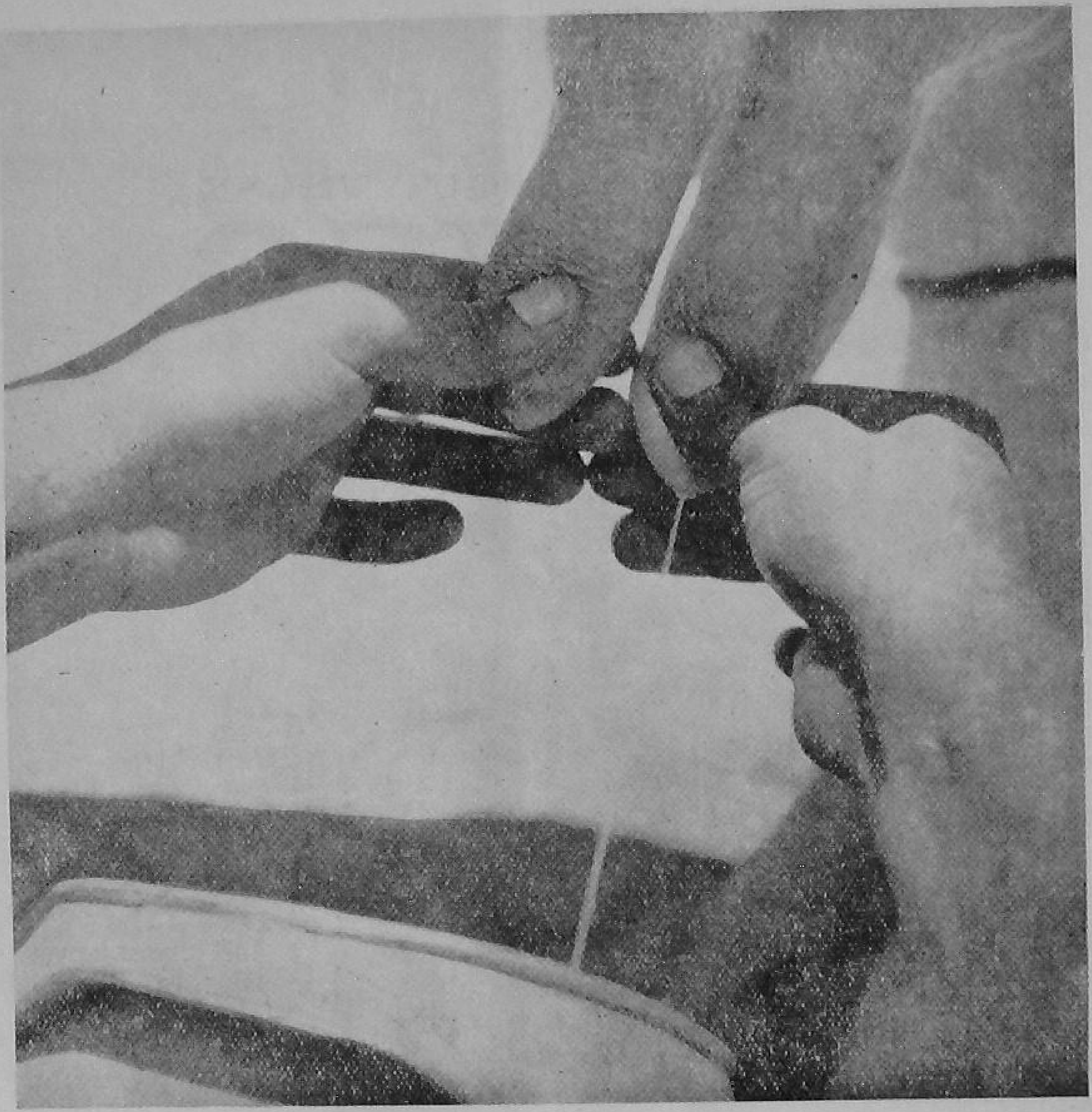
These are the wrong ways of milking. Avoid putting the thumb between the teat and your palm

Before milking, take out a few streams of milk from each teat separately into a cup or a piece of black cloth and watch for anything unusual. If it is normal, the teat should be milked. In case you suspect that the milk from any teat is not normal, milk this teat into a separate container. Milk from a mastitis-affected teat should not be used for drinking. Dispose of such milk so that it will not be a source of infection.

Milk quickly, smoothly and completely. Use the correct method of milking. After milking, see that no milk sticks to the teats. Boil the cloth you have used for cleaning the udder and dry it in the sun.

Never attempt treating the animal yourself; take help from a veterinary doctor





Make it a practice to draw a few streams from each teat separately into a strip cup and look for abnormalities every time you milk your animal

Also wash your hands in warm soapy water and then in chlorine or potassium permanganate solution and dry them before milking the next animal.

INFECTED ANIMAL

When you have an animal suffering from mastitis, have it milked only after all the healthy animals have been milked. Have the milk of this animal in a special container and destroy it. Do not feed it to calves or human beings. Do not also put this animal to pasture. See that you empty its udder completely. Clean the udder with a disinfectant solution and seek immediate help from the nearest veterinary doctor. He will be able to suggest how you should treat the animal.

BE ALERT ABOUT THESE MANGO ENEMIES

By D. B. REDDY

MANY farmers see their mango trees in full blossom, but later find but a few fruits formed, or none at all !

This happens because of attacks from certain insects and diseases during the flowering period. Among the pests are the mango hoppers and mealy bugs, and among diseases, the mildew.

Mango hoppers (also called jassids) are small greyish brown insects. Three kinds of these insects attack the mango. They suck the juice from flowers

and tender leaves. They lay eggs in flower buds and thus damage them. They also damage the mango tree by excreting a honey dew on the flower shoots and leaves, on which a sooty mould develops.

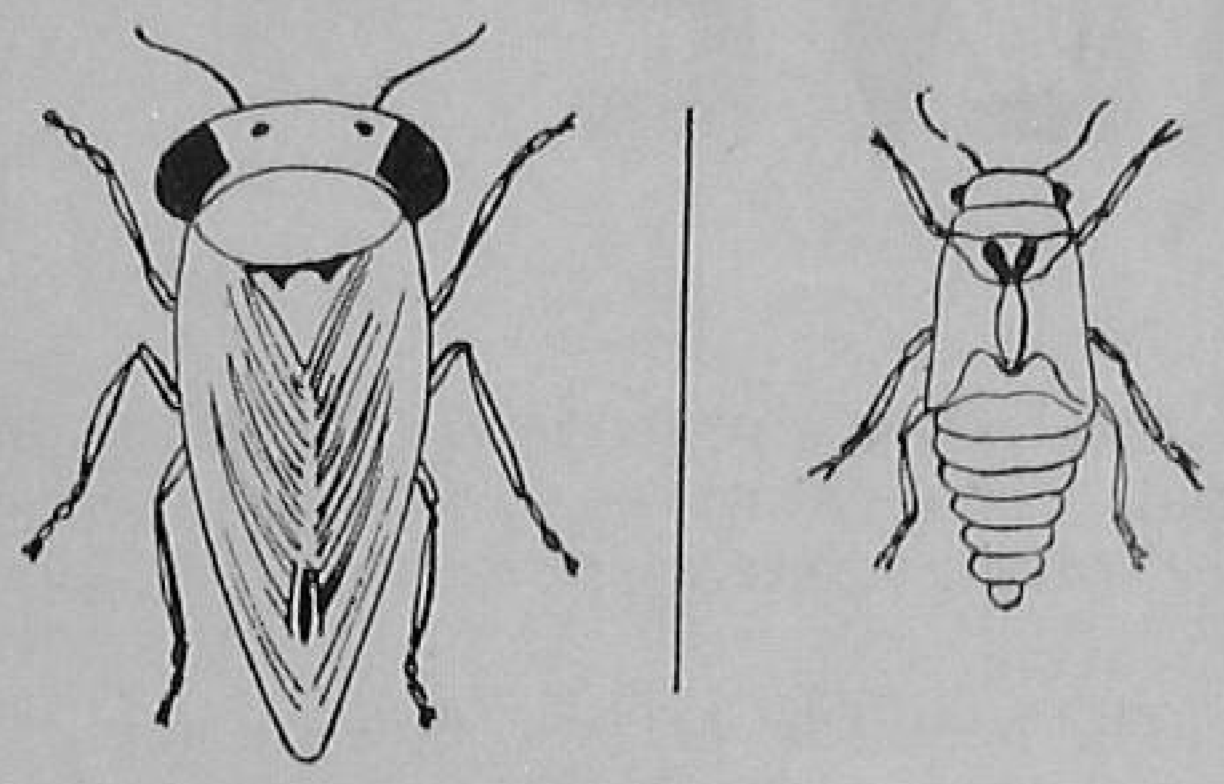
The hoppers are active soon after the flower buds open. Mango blossoms suffer the most in January-February.

The mealy bug, a soft-bodied, plump insect, is the other pest of the mango. It sticks on to the flower stalk, the mid-rib of young leaves and

the tender shoots, from where it sucks the sap. Attacked parts die, and flowers do not set fruit properly. The stalks become so weak that with the slightest jerk, the fruits drop off. Like the hopper, the bug also gives out honey dew which encourages the development of sooty mould.

The bug-attack starts in January and goes on up to mid-April. In April-May, it lays eggs in the soil near the base of the tree trunk. The young ones which hatch out climb over the trees.

A serious disease of the mango flowers is the mildew. The disease often is seen at



Mango hopper—adult (L) and nymph (R)

the same time as the mango hopper attack. It attacks fruits, flower scales, tender buds, axils and stalks. The attacked portion gets a white covering of the fungus, which turns powdery later. Flowers which are attacked fail to open, and shed. Young fruits, if attacked, do not grow in size and drop off.

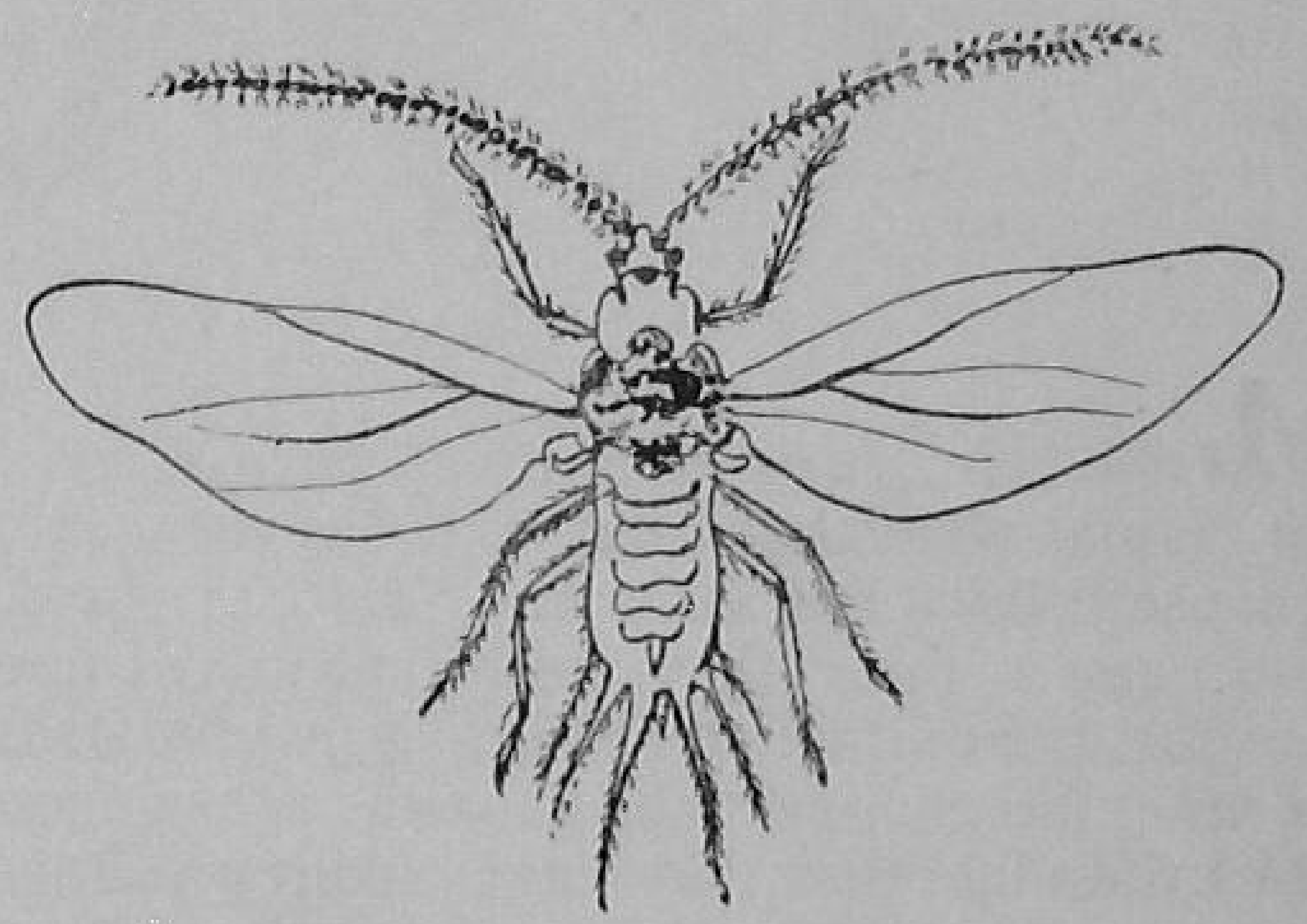
You can control mango hoppers by spraying 0.16 to 0.25 per cent DDT on the trees. Mix 1 pound of 50 per cent wettable DDT in 20 to 30 gallons of water. You can also use 0.03 per cent 'Diazinon,' 'Endrin' or 'Parathion' (20 per cent E.C. at 1 ounce in 4 gallons of water). One spray given just after the flowers have opened should be sufficient to control the pest.

You can control the mealy bugs by :

● Keeping the area around the tree trunk clean, and stirring the soil round the base up to September. This way the eggs are exposed and are killed.

● Putting a 2-inch wide and 1/8th inch thick board round the tree trunk, 2 to 3 feet above the ground in December. This will prevent the young bugs from crawling up on the tree.

● Dusting 5 per cent 'Aldrin' round the base of the tree or spraying 'Dieldrin' (20 per cent) at one ounce in three gallons of water around the base of the tree and on the trunk up to 2 to 3 feet, if you do not get the sticky band.



Mango mealy bug—it has a pair of smoky wings

● Spraying 0.05 per cent 'Malathion' when bugs are seen on the tree. Apply the spray at 3 to 4 gallons per tree, depending on the size of the tree.

For powdery mildew, dust or spray sulphur on the tree. Use finely-powdered sulphur (250 to 350 mesh) or spray wettable sulphur at one pound in 30 gallons of water.

Since mango hoppers and powdery mildew occur together many times, you can combine the control measures for both.

It is better that you do not wait for the disease or pests to appear, but take action early. If you have any difficulty, consult your Gram Sevak or Agricultural Extension Officer of your Block.

COWS THAT DON'T CALVE

By M. H. PATHAN

MOST farmers or dairymen believe that the animal which has been mated is pregnant, because it does not show any sign of heat. But many a time they find that after some months, the animal comes into heat or fails to show the changes that go with pregnancy. They then feel that they have spent on looking after an animal which will not be giving them the calf or the milk.

An animal, if it is to be paying, one should be productive. If you want the dairy animal to increase its output and cut down the cost of maintenance, it should regularly calve and have short dry periods. For this purpose, it should be free from diseases which prevent regular calving.

To many it will be a surprise that cows not producing calves regularly or not producing calves at all are responsible for losses which are greater than those caused by dangerous diseases.

Infertility is not a disease in itself but may be caused by bad management or by a large group of diseases.

It is always better, and also very easy, to get the animal examined to see whether its reproductive organs are healthy and normal. This, however, you have to get done through a veterinary doctor.

The need for getting the animal examined is also necessary in cows. Sometimes a pregnant animal also shows signs of heat. If such an animal is mated again, abortion may result.

A veterinary doctor can definitely diagnose pregnancy of a period of three months and above. An experienced doctor can do it when pregnancy is even of a shorter duration. If the animal is not pregnant, he will be able to tell you the reason for its being so.

Even when you want to sell or purchase an animal, it is better to pay thought to the period for which it is going to be dry, for you have to pay for keeping it. The animal will be a source of income only when it calves.

Hence, a wise farmer and a wise dairyman will always make it a point to ensure that they maintain only paying animals by getting them examined for pregnancy.

TIME FOR PLANTING LATE WINTER

VEGETABLES

Now is the time to plant your late winter varieties of such vegetables as brinjal, chillies, musk melon, radish, cucumber, lady's finger and bitter gourd.

BRINJAL

RAISE seedlings in the nursery and then transplant. Prepare a seedbed, manure it with well-rotted farmyard manure or leaf mould. Sow ½ to ¾ pound of seed (sufficient for an acre) in regular rows and level the surface of the bed. Cover it with dried grass or gunny. Remove the cover as soon as the seed starts germinating. The seedlings will be ready for transplanting in six to eight weeks.

By growing improved varieties and with proper care, brinjal can give a very high yield

Select and plant only healthy seedlings in raised or flat beds. Space the plants at 2 feet between rows and 1½ feet between plants. (For *Pusa Purple Round*, the spacing should be 2½ feet by 2½ feet). Irrigate immediately after and every 10th or 12th day.

Top-dress with three to four maunds of ammonium sulphate or a mixture of equal doses of ammonium sulphate and superphosphate per acre. Apply the fertilizer on both sides of plant rows.

An average yield of 150 maunds can easily be harvested from an acre.

CHILLIES

You can sow chillies from now till the end of March. Raise seedlings in the nursery. One to one and a half pound of seed will suffice to plant an acre. But if you go in for direct planting (as in the Punjab), you will need four pounds.

Prepare flat beds, manure with sludge or compost, and plant out the seedlings with

Spray chillies with tobacco decoction if you want to save them from thrips

Bhindi *plant in flower and fruits; harvest the pods when they are tender*

a spacing of 1½ to 2 feet between rows and 1 foot to 1½ feet between plants.

Three weeks after planting, apply liquid manure or ammonium sulphate at the rate of five to six maunds per acre. This can be applied in two or three doses at fortnightly intervals. Irrigate every seven to ten days.

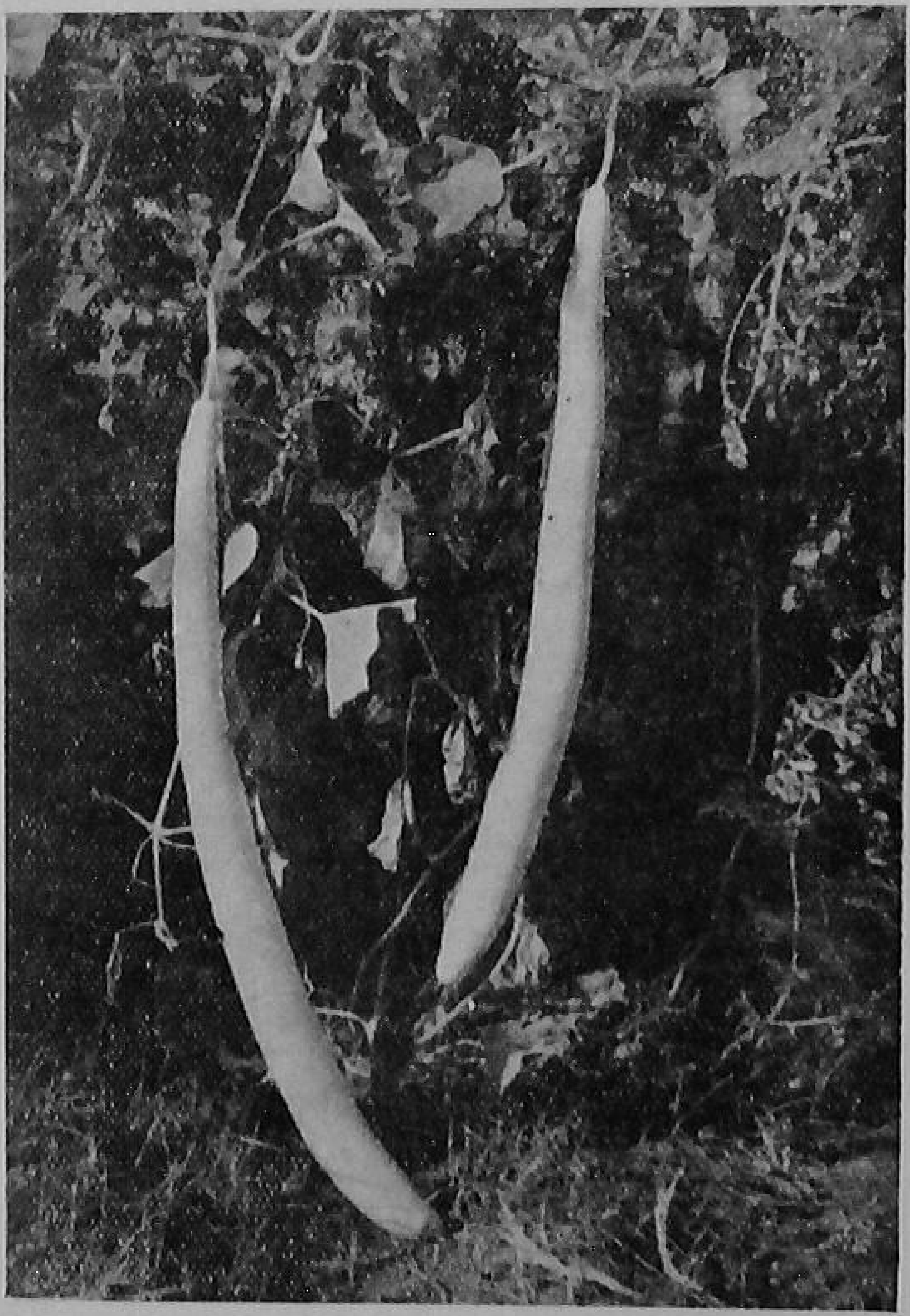
You can harvest green chillies after 60 days of transplanting and the red ones after 90 days.

LADY'S FINGER

Dig up the plot and apply farmyard manure or compost at 20 tons per acre. After levelling the soil, sow seeds 1 foot apart in rows 1½ to 2 feet apart. About 10 to 12 pounds of good seed will go to an acre. You can continue planting from February to March.

A month after sowing, apply ammonium sulphate at three to four maunds per acre. A mixture containing equal parts of groundnut cake, ammonium sulphate and superphosphate is also recommended.

Bottle gourd takes 75 to 90 days to mature, giving 200 maunds an acre



Irrigate every 10 to 14 days.

In the early stages of crop growth, mosaic-affected plants may show curled up leaves due to an attack of jassids and white flies. Uproot and remove such plants.

Plants start fruiting after 45 to 50 days after sowing. Pick when pods are tender.

A pumpkin—plant needs an area of 150 square feet for spreading

An average yield of 80 to 100 maunds per acre is what you should get.

BOTTLE GOURD

Sow between February and March.

Make beds five to eight feet wide. Dig them and add 10 to 25 tons of farmyard manure or compost. Sow the seed on either side of the bed. You will need four pounds of seed for an acre.

The seed germinates within a week's time. Thin out the seedlings, keeping only good, strong ones.

Irrigate at four to five days' interval. Apply three to four maunds of ammonium sulphate to the crop.

PUMPKIN

Sow between February and March.

About four pounds of seed will suffice to plant an acre.

Prepare beds six to eight feet wide, and sow on both sides of the beds. A spacing of three feet between plants is recommended.

The crop needs 15 tons of farmyard manure and two to three maunds of ammonium sulphate per acre. Irrigate at seven days' interval.

The yield ranges from 250 to 300 maunds.

BITTER GOURD

Sow the seed on both sides of the beds (each four to five feet wide) 1½ feet to two feet apart. Four to five pounds of seed will be needed. You can continue sowing till March.

Manure the beds with 20 tons of farmyard manure and apply two to three maunds of ammonium sulphate an acre. Irrigate at four to five days' interval. The crop will need a bower.

An acre of bitter gourd will yield 80 to 90 maunds of fruit.

Raise **ash gourd** and **sponge gourd** in a similar manner. An acre of sponge gourd will yield 125 maunds of fruit, and ash gourd 200 maunds, on an average.

MUSK MELON

Musk melons are usually sown in circular pits in river beds. You can sow the seed from mid-January to March.

Three to four pounds of seed will go to an acre. Better sprout the seeds by keeping them in a wet gunny cloth before sowing.

Sow on both sides of the beds eight feet wide, giving a spacing of three to four feet between seeds.

To get good yields, you have to feed the crop with 20 tons of farmyard manure or compost and two to three tons of ammonium sulphate per acre.

Irrigate at seven days' interval in the early stages of crop growth, and later increase the interval to fourteen days. Fruits will be ready in 100 to 120 days.

SQUASH MELON

Sow seed from mid-February to April, using a seed-rate of four to five pounds an acre.

Make beds of four to five feet width, and sow on both sides.

Manure with 15 tons of farmyard manure per acre. Apply two to three maunds of ammonium sulphate after a month of sowing.

Water regularly at four to five days' interval. Keep the land free of weeds.

An acre of squash melon will yield about 100 maunds an acre.

CUCUMBER

For an early summer harvest, sow the seed now. You can continue the sowing up to March.

Two to three pounds of seed will be sufficient for planting an acre.

Sow in circular pits on both sides of the bed at two to three feet distance.

Irrigate regularly to keep the soil just moist. Do not over-irrigate. The approximate interval for irrigation is four to five days.

The crop needs 15 to 20 tons of farmyard manure per acre. When the plants are a month old, give two to three maunds of ammonium sulphate.

Fruits start setting after 60 to 90 days of sowing, and continue for two months.

Pick when the fruits are green and tender.

Cucumber—consumers like it green and tender

The Madras Farmers' FERTILIZER GUIDE

HERE IS A GUIDE THAT TELLS THE MADRAS FARMER WHAT AND HOW MUCH OF FERTILIZERS TO USE FOR IMPORTANT CROPS HE RAISES

Crop and Tract	*Nitrogen* (N)	*Phosphoric acid* (P_2O_5)	*Potash* (K_2O)	*Remarks*
Paddy				
Coimbatore, Ramanathapuram, Tirunelveli, Tanjore (Old Delta)	30	30	Nil	Basal dressing of 5,000 pounds of green manure
South Arcot, Nilgiris, Salem, North Arcot, Trichy, Madurai, Tanjore (New Delta)	30	30	15*	Basal dressing of 5,000 pounds of green manure
Kanyakumari, Chingleput	30	30	30*	Basal dressing of farmyard manure at 10 tons per acre or 10,000 pounds of green manure.
Sugarcane				
South Arcot and other districts	250	60*	80*	

Crop and Tract	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	Remarks
Cotton				
Rainfed, (Areas receiving less than 30 inches of rainfall)	—	—	—	Basal dressing of 5 tons of farmyard manure
Irrigated (All areas)	40	15*	15*	Basal dressing of 5 tons of farmyard manure
Oilseeds				
Groundnut Rainfed (Areas receiving over 30 inches of rainfall)	10	10 to 20	20 to 30	Basal dressing of 2½ tons of farmyard manure
Groundnut (Irrigated)	15	30	45	Basal dressing of 5 tons of farmyard manure
Coconut	0.6	0.6	1.2	Over the basal dressing of 100 pounds of green leaf per acre; ¼ dose of fertilizers per tree below 5 years of age; ½ dose for trees 5 to 10 years of age
Gingelly	—	—	—	5 tons of farmyard manure or compost per acre as basal dressing
Millets				
Irrigated *Cholam* (*Co. 18*)	40	20	0	Basal dressing of 5 tons of farmyard manure
Irrigated *Cumbu* (*X. 3*)	40	20	0	,,
Irrigated *Ragi* (*Co. 7*)	40	20	20*	,,
Rainfed				
Areas receiving less than 30 inches of rainfall (*Cholam* and *Cumbu*)	—	—	—	Basal dressing of 5 tons of farmyard manure
Areas receiving 30 to 32 inches of rainfall (*Cholam* and *Cumbu*)	—	—	—	Residual effect of fertilizers applied to the cotton crop plus 5 tons of farmyard manure will be enough

Crop and Tract	Nitrogen (N)	Phosphoric acid (P_2O_5)	Potash (K_2O)	Remarks
Areas receiving above 35 inches of rainfall (*Cholam Co. 19*)	30	20	0	Basal dressing of 5 tons of farmyard manure
Potato				
Manure mixture with the following manures and fertilizers to be applied to one acre.	Groundnut cake 500 pounds, ammonium sulphate 200 pounds, steamed bonemeal 350 pounds, superphosphate 672 pounds, potassium sulphate 224 pounds			Basal dressing of 5 tons of farmyard manure
Chillies	50	30	30	—
Fruits				
Banana (Tanjore, Trichy)	200	70	250	Basal dressing of 10 tons of farmyard manure
Grapes	60	30	100	Basal dressing of 10 tons of farmyard manure per acre
Citrus	0.5	1.0	1.5	Basal dressing of 100 pounds of farmyard manure per tree*
Vegetables				
Leafy	45	—	—	Basal dressing of 10 tons of farmyard manure per acre
Tobacco				
Rainfed	20	30	—	Basal dressing of 5 to 10 tons of farmyard manure (potash to be used in the form of potassium sulphate)
Irrigated	30	30	30	
Virginia	15	45	30	
Turmeric	50	45	45	Basal dressing of 5 to 10 tons of farmyard manure

(The mark * represents the dosage suggested by representatives of farmers or firms on the basis of experience on trials conducted by them).

VACCINATE

your chicks when a day old

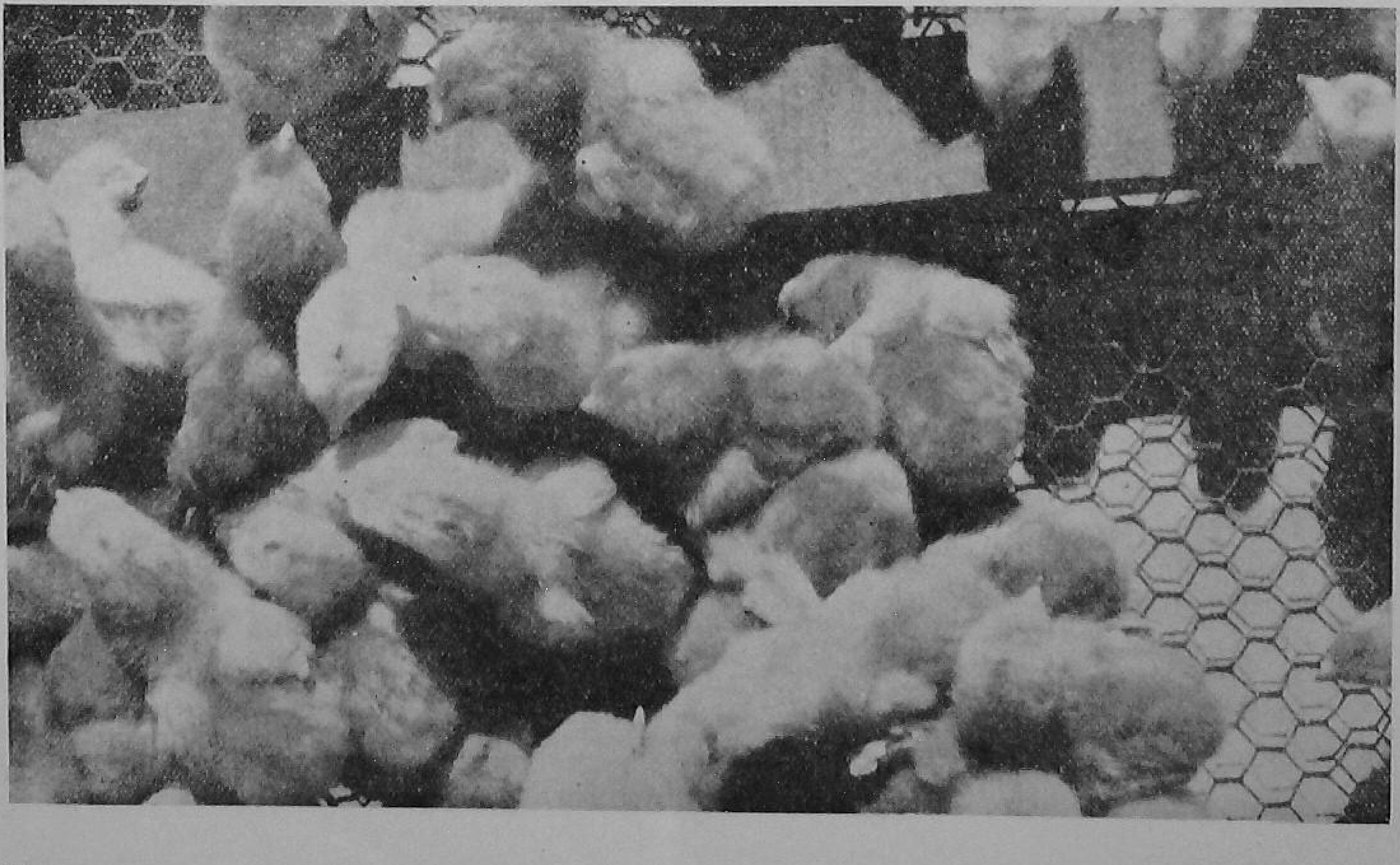
By S. G. IYER

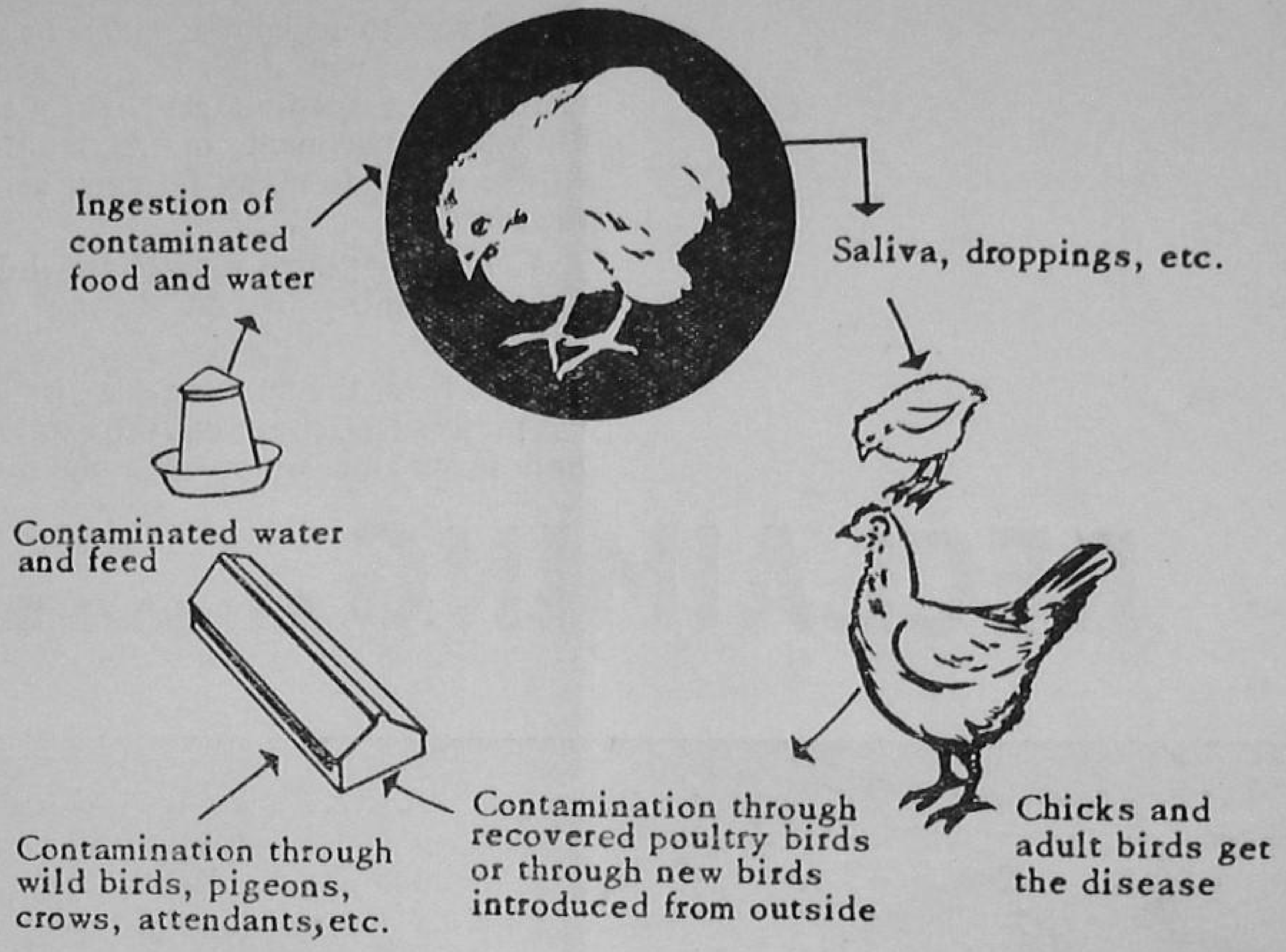
A new vaccine has now been produced which poultry farmers can use for vaccinating day-old baby chicks and protecting them against Ranikhet.

The Poultry Research Division, Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh, which evolved this new vaccine, found that day-old chicks, when given this vaccine in the nostril or eye, became immune to the disease in 48 hours. The immunity lasts for 16 weeks.

Ranikhet is a very deadly disease of chicks. Sometimes it kills birds in a few hours after attack. In a chronic state, it lasts for three to four weeks. In affected

Just-born chicks—they need protection against Ranikhet





The life-cycle of Ranikhet disease

birds you notice fever, thirst, a watery yellowish diarrhoea with a bad smell, and paralysis. When the disease is chronic, twitching of the head and lameness or paralysis of the legs and wings may occur.

Sometimes, Ranikhet is mistaken for very many other diseases. As such, it is better to find out what exactly the disease is when the birds show these symptoms. For which the help of a veterinary doctor is needed.

There is no treatment for Ranikhet. So far, clean rearing conditions and vaccination have been the only way of preventing the disease from attacking the birds.

For the last 20 years, veterinary doctors in India have been using a vaccine which is able to protect 4 to 6-weeks-old chicks.

It is easy to vaccinate day-old chicks with the new vaccine as you do not need any syringe or other equipment for the purpose. However, since the immunity lasts for a short time, it is better that you again vaccinate the birds when they are six to eight weeks of age with the usual vaccine that is available.

With farmers raising a large number of baby chicks today in several areas of the country, it is best that these chicks are given complete protection with the new vaccine now made available by the Izatnagar Institute.

By. J. S. KANWAR

THE way to reclaim a *kallar* or saline or alkaline soil will differ from place to place. Here is the method recommended by the Punjab Department of Agriculture. This will be of use to many farmers, especially in the North.

Getting your soil analysed should be the very first thing to do before taking up other steps.

Where the water-table is high, i.e., within five feet, drain out the excess of water and lower the water-table by taking up a

RECLAIMING *KALLAR* SOILS

A plot of land badly affected with salinity and alkalinity

Gypsum is being used to reclaim alkaline soils

suitable drainage system. Draining out the excess water is very important.

Next put up strong two-foot high bunds around each field.

Apply four tons of gypsum if the *p*H of the soil is above 9.0 (the soil analysis will tell you this), and mix it well with the soil. The quantity of gypsum to apply will vary according to the soil. You can use sugar mill wastes in place of gypsum.

Apply a foot of water to the field and let it stand for at least a fortnight. This will help leach down the salt.

Sow *dhaincha* in the second week of March when the field is under water. Before sowing, apply two to three maunds of ammonium sulphate and an equal dose of superphosphate to the field. Broadcast 24 to 30 seers of *dhaincha* seed per acre. Soaking the seed in water for about four to six hours before sowing will help in a higher percentage of germination. Give light and frequent irrigations in the early stages of plant growth. This will protect the germinating plants from any salt injury. However, see to it that the plants do not remain submerged in water.

Plough in the *dhaincha* plants when they are about eight weeks old.

Two to three weeks after green manuring with *dhaincha*, plant out the paddy seedlings. Just before transplanting paddy, apply 3 maunds of ammonium sulphate, 2 maunds of superphosphate and 20 seers of muriate of potash. This is important. Harvest paddy in time, after which sow *senji* barley, berseem or sugarbeet.

If you do not have enough water for raising paddy, sow *dhaincha* with the rains and plough in in early September, and grow barley instead.

Repeat this procedure for two or three years till you can get normal yields from your fields. After the first round of operations, you can leave out gypsum, but you should not forget to manure *dhaincha* with superphosphate, and paddy with ammonium sulphate.

Contact your local Agricultural Chemist for help if you need any. And, remember that good soil management pays, more so in reclaiming and putting to use the *kallar* soils.

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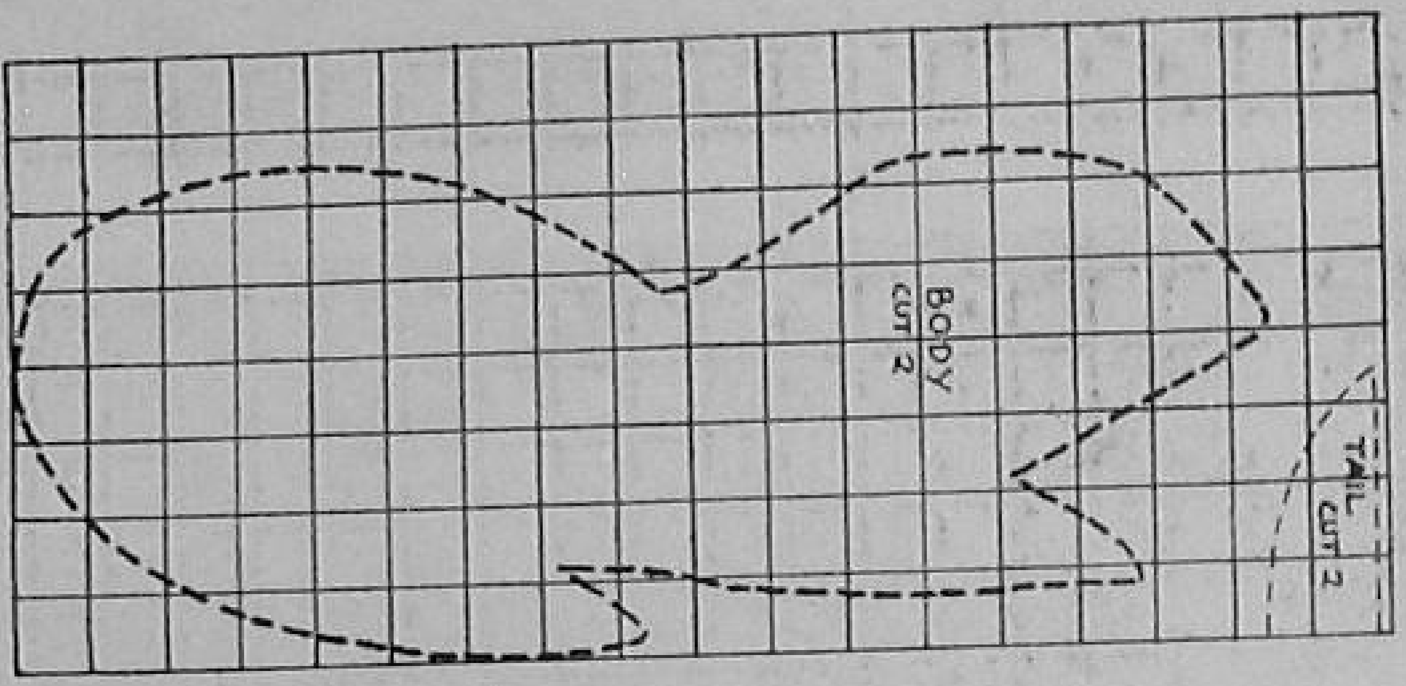
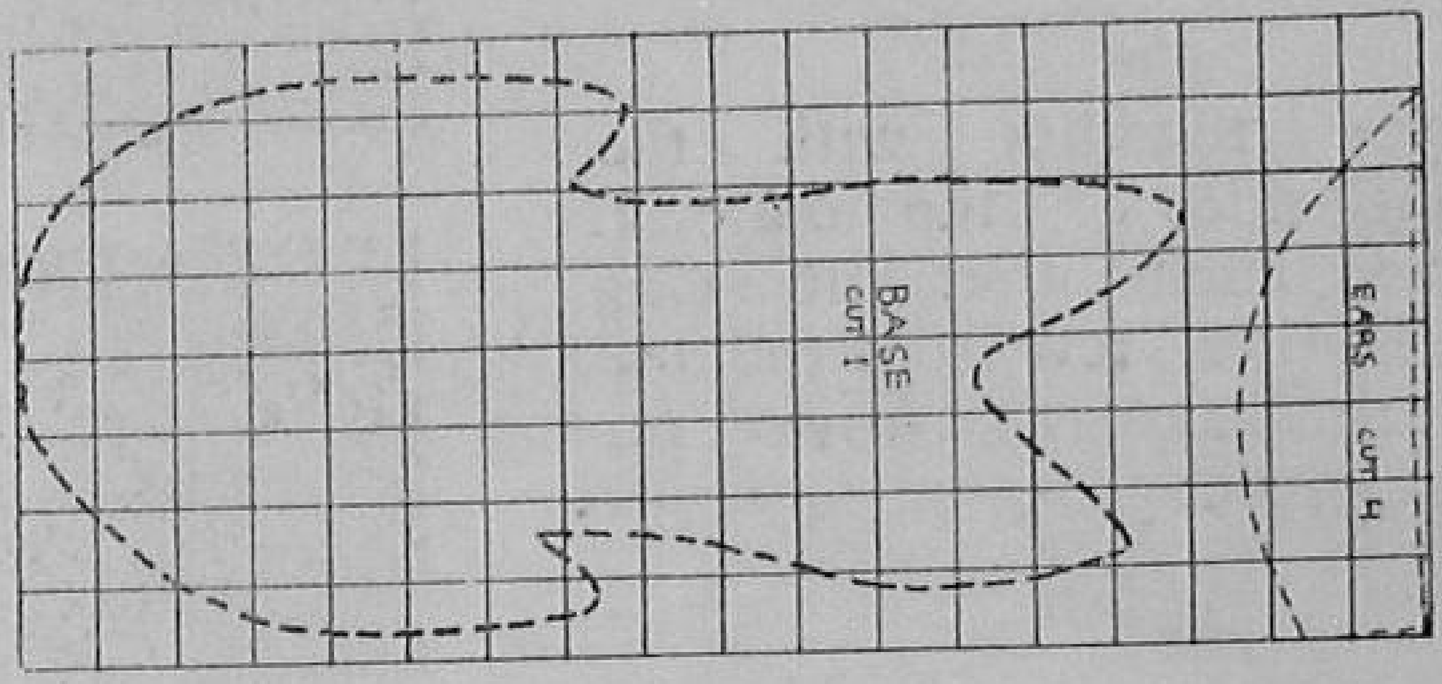
MAKING BUNNY RABBIT IS FUN

By KAMLESH PURI

A bunyn rabbit will be a good toy for a child





to play with. And it is so easy to make a nice one yourself.

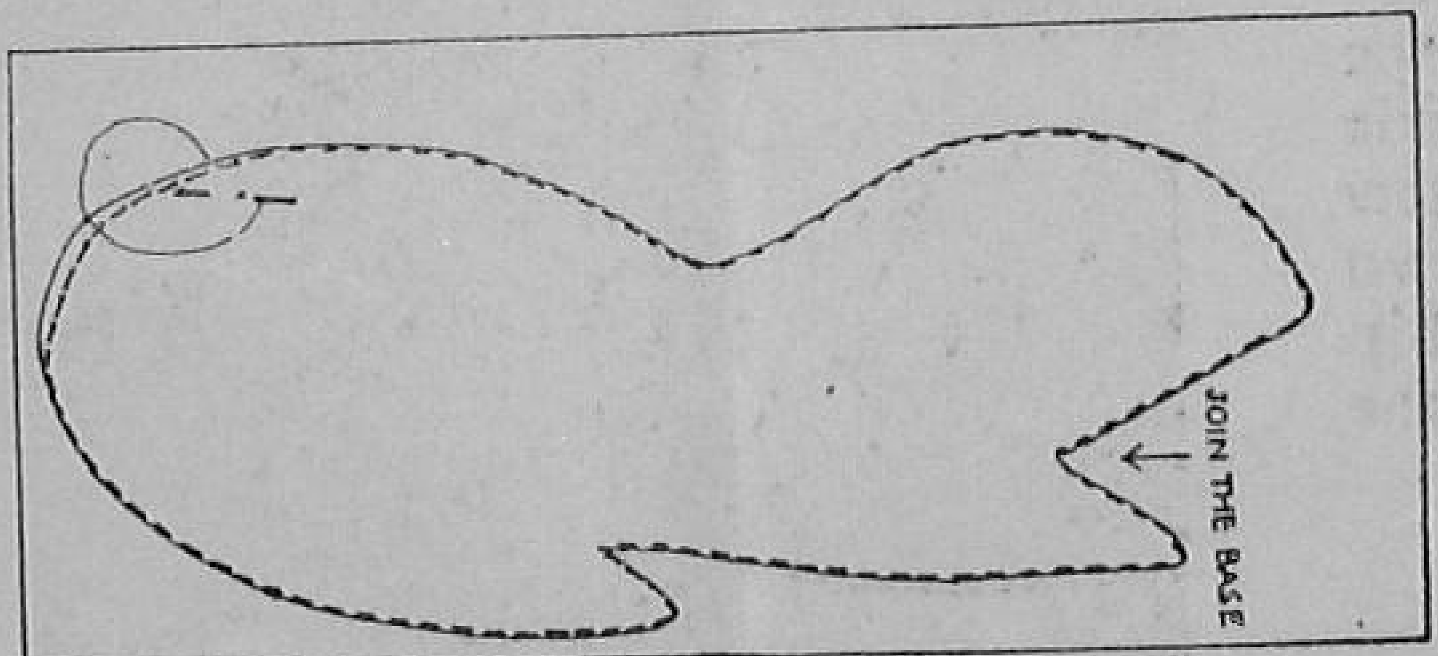
Materials you need: White, grey or slate-coloured felt or flannel 9 inches by 36 inches, sewing thread (white or of the colour matching the felt), black and red stranded cotton, two beads for eyes and cotton wool for stuffing.

HOW TO MAKE THE TOY

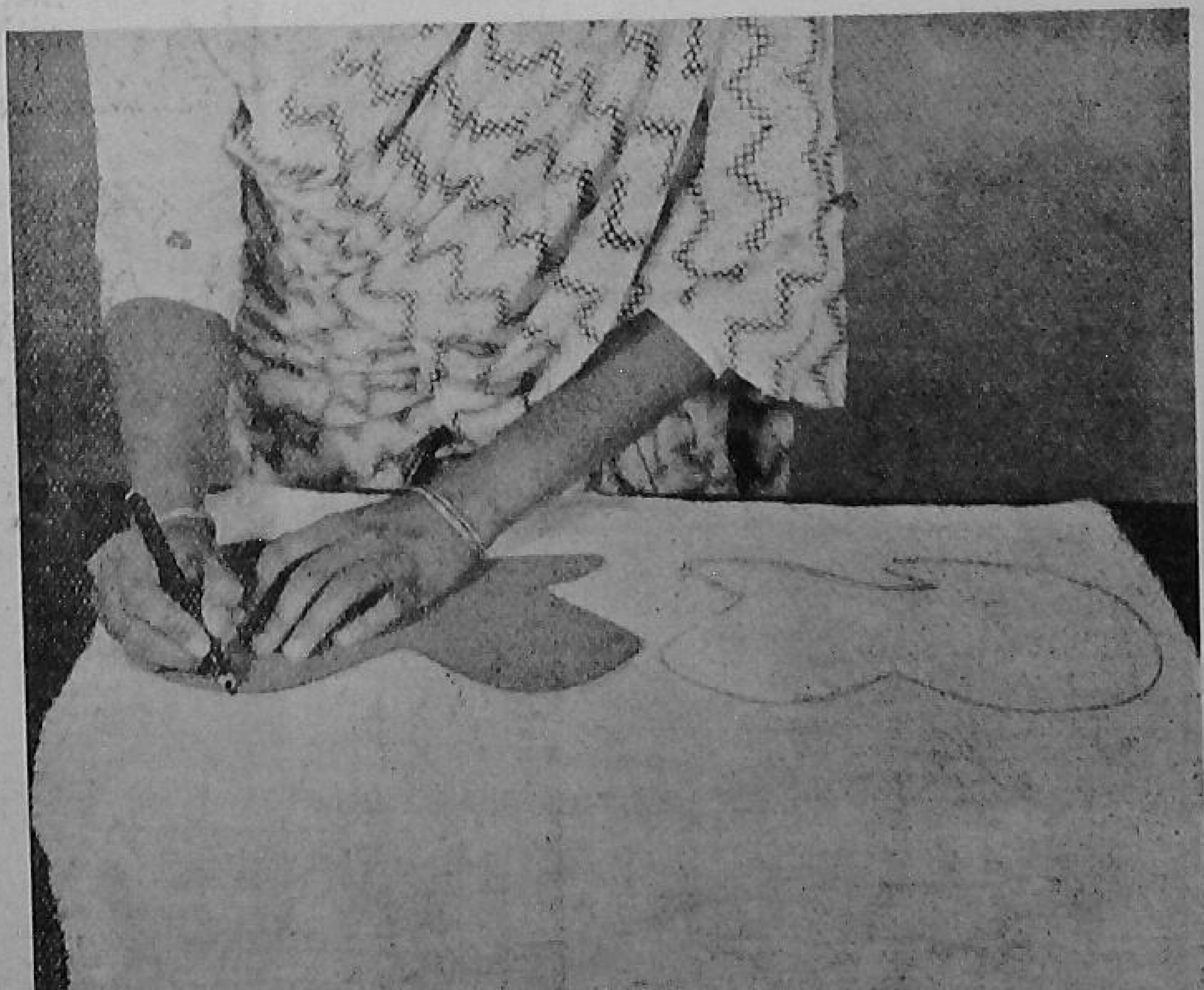
Make out the pattern in full size on the flannel or felt. Cut the base 10 inches by 6 inches. Then cut the two body pieces of 10 inches by 8 inches each, two ears and the tail on double material.

(If the material has wrong and right sides, reverse the pattern for one body piece and two ear pieces and one tail piece.)

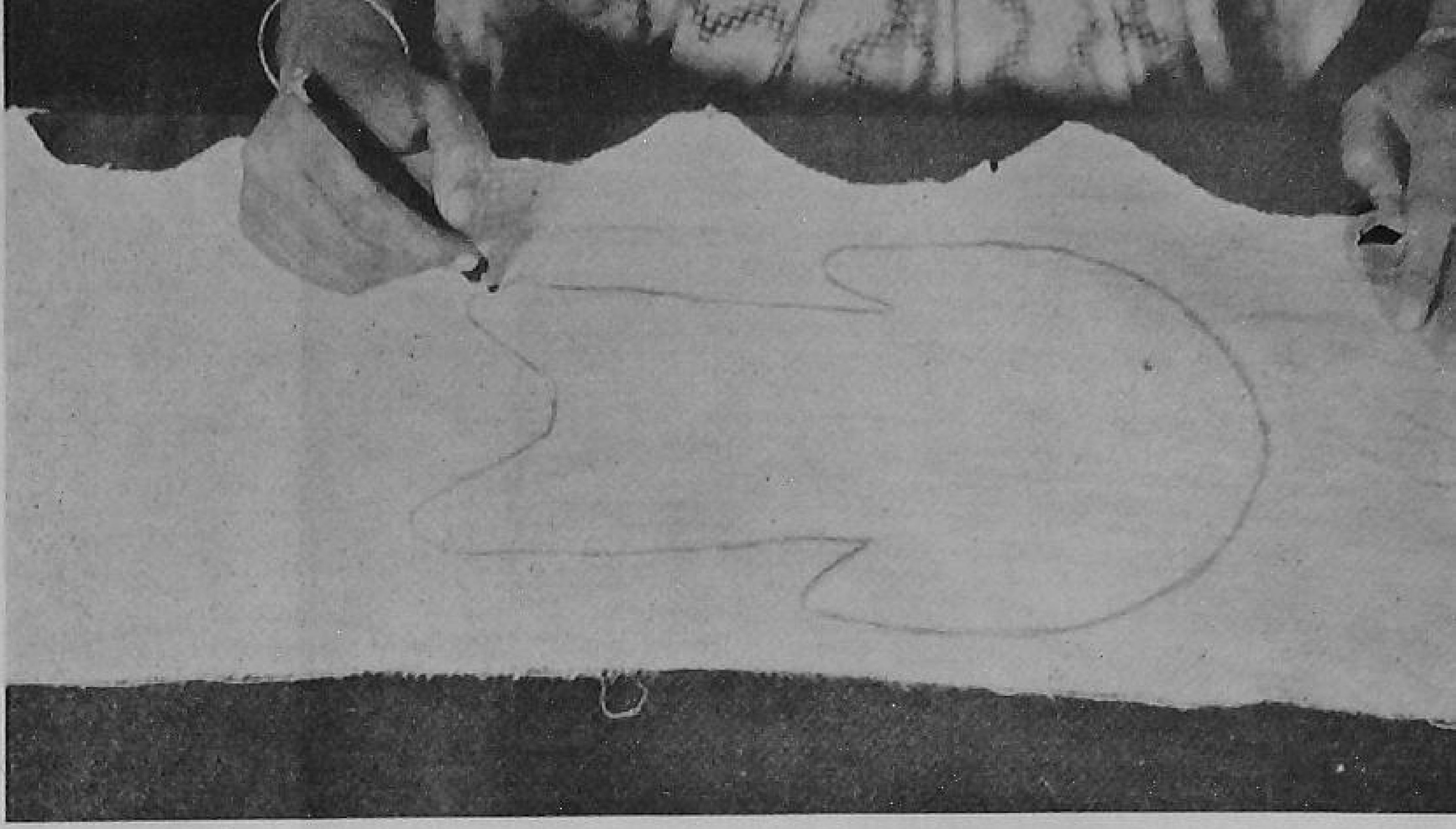
Make the body first; pin the body



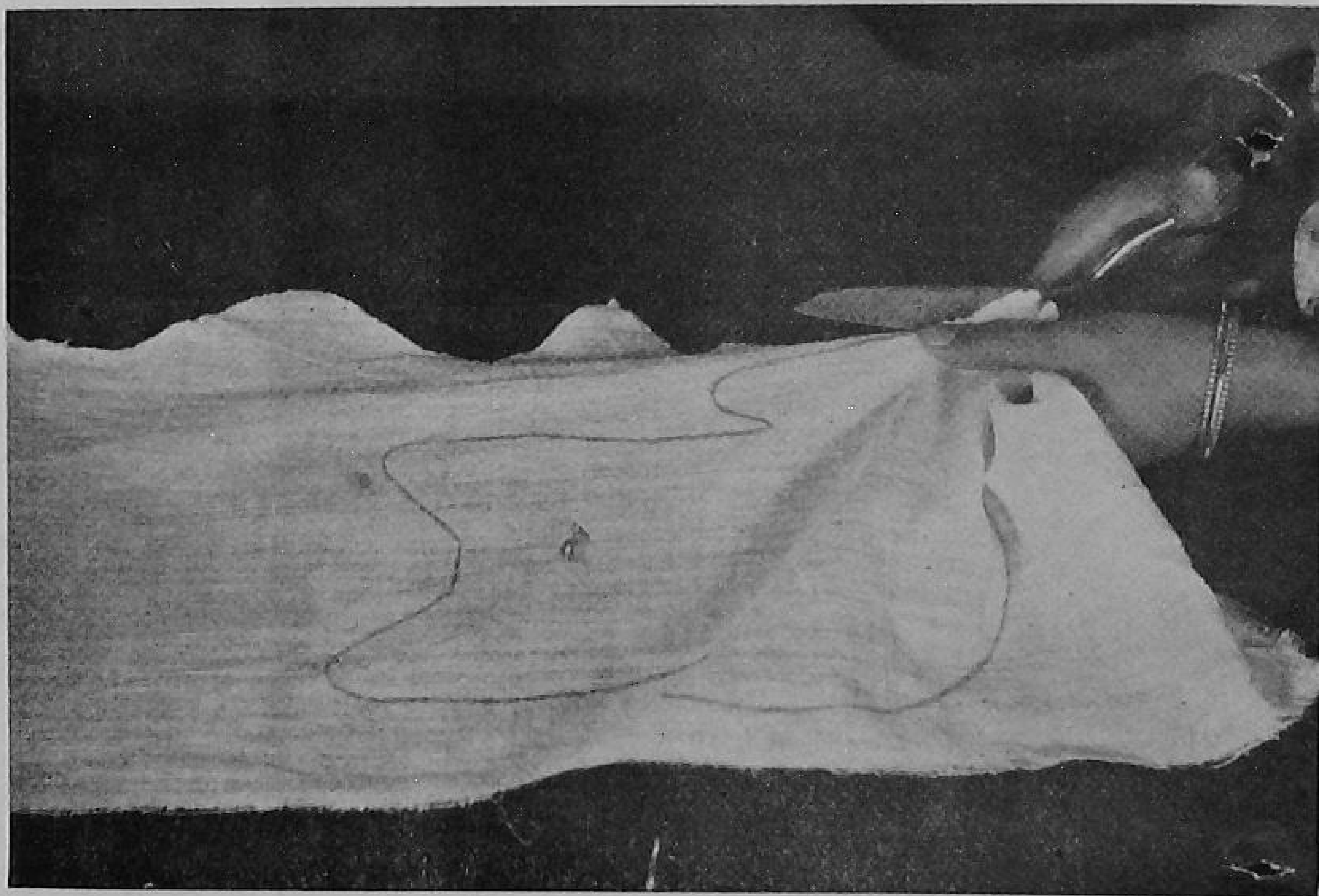
Tracing out the pattern



Tracing out the base and cutting it out



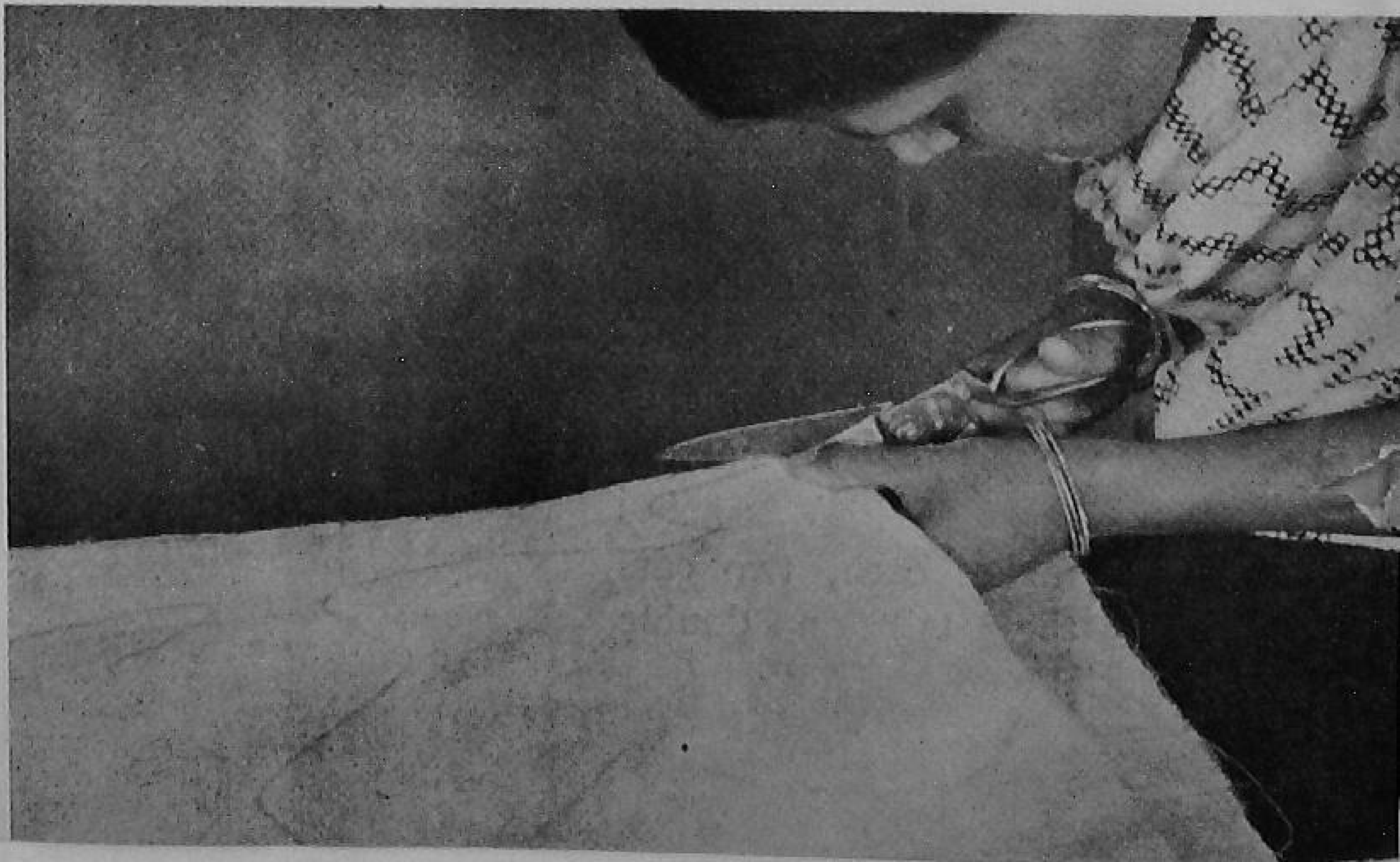
pieces together with the right sides of the material facing, each other and using back-stitch sew from the tail to the neck as shown on previous page.

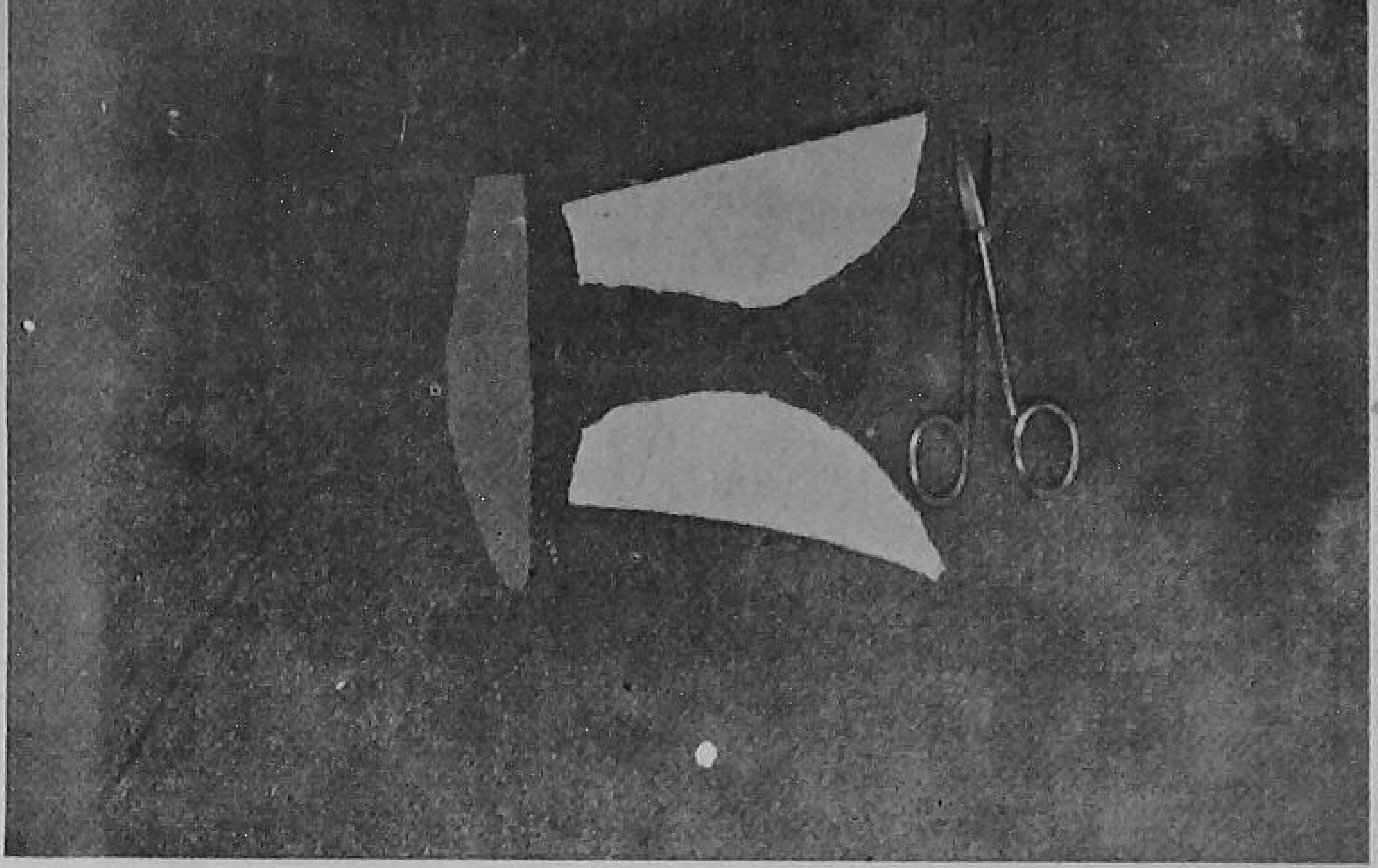


After firmly joining the two body pieces, fit in the base in place with right side of the material inside; sew firmly the base to the two body pieces, leaving the hip portion open for turning the cover.

Turn the cover so that the seams are inside the body, and stuff with cotton. Insert

Cutting out the two body pieces





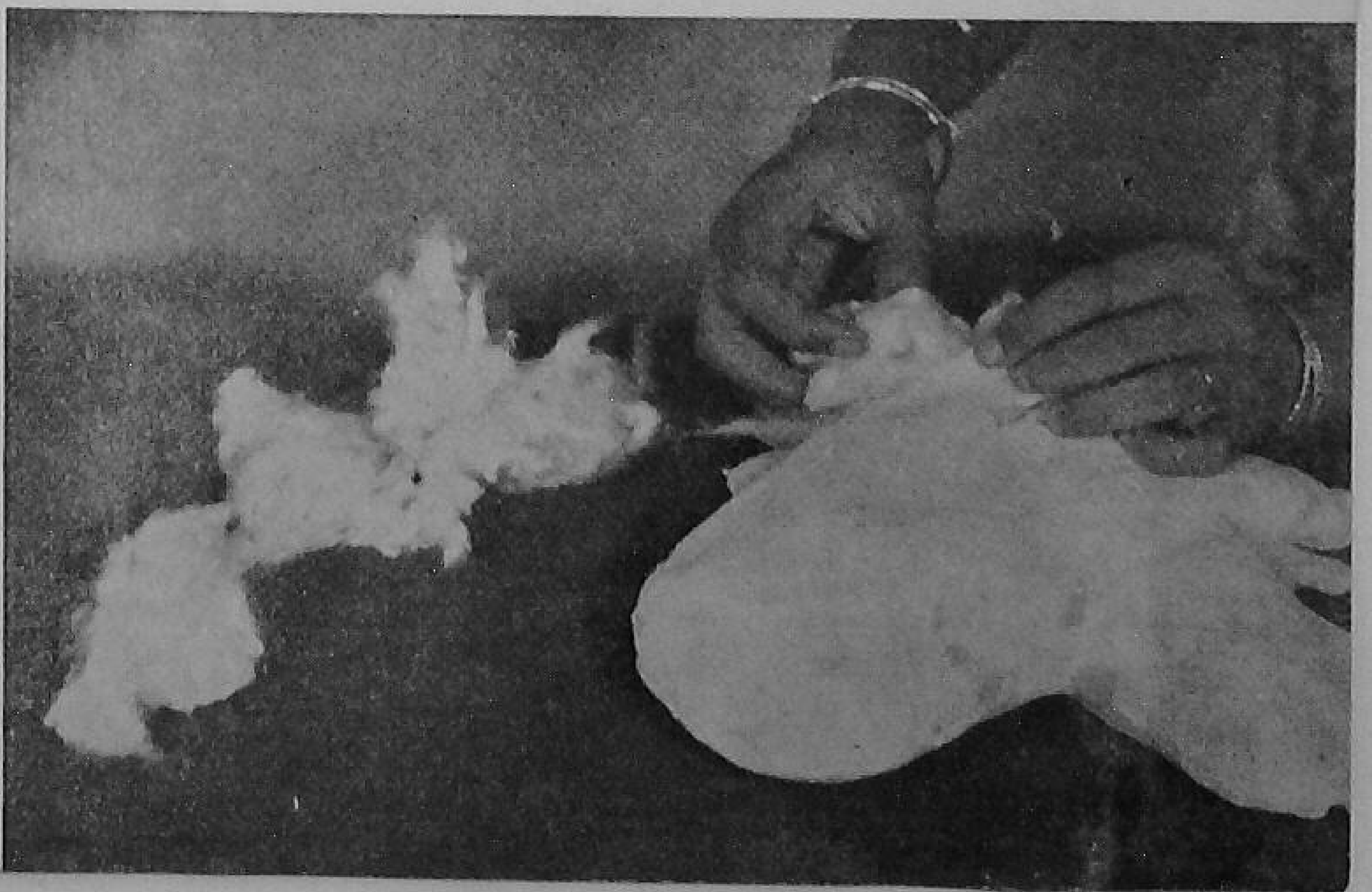
Cut out the ears of the bunny rabbit

only small pieces of material at a time, and position them with the help of a small knitting needle. The rabbit body is very simple to fill. See the stuffing is worked into proper shape. After the

Stitching the rabbit starting from the tail to the neck

stuffing is complete, close the opening at the hip by sewing the edges of the material together.

Make the tail next ; place the two tail pieces together with the right side of the material inside ; sew them together. Turn the tail cover, fill it with stuffing and stitch it very firmly to the body.



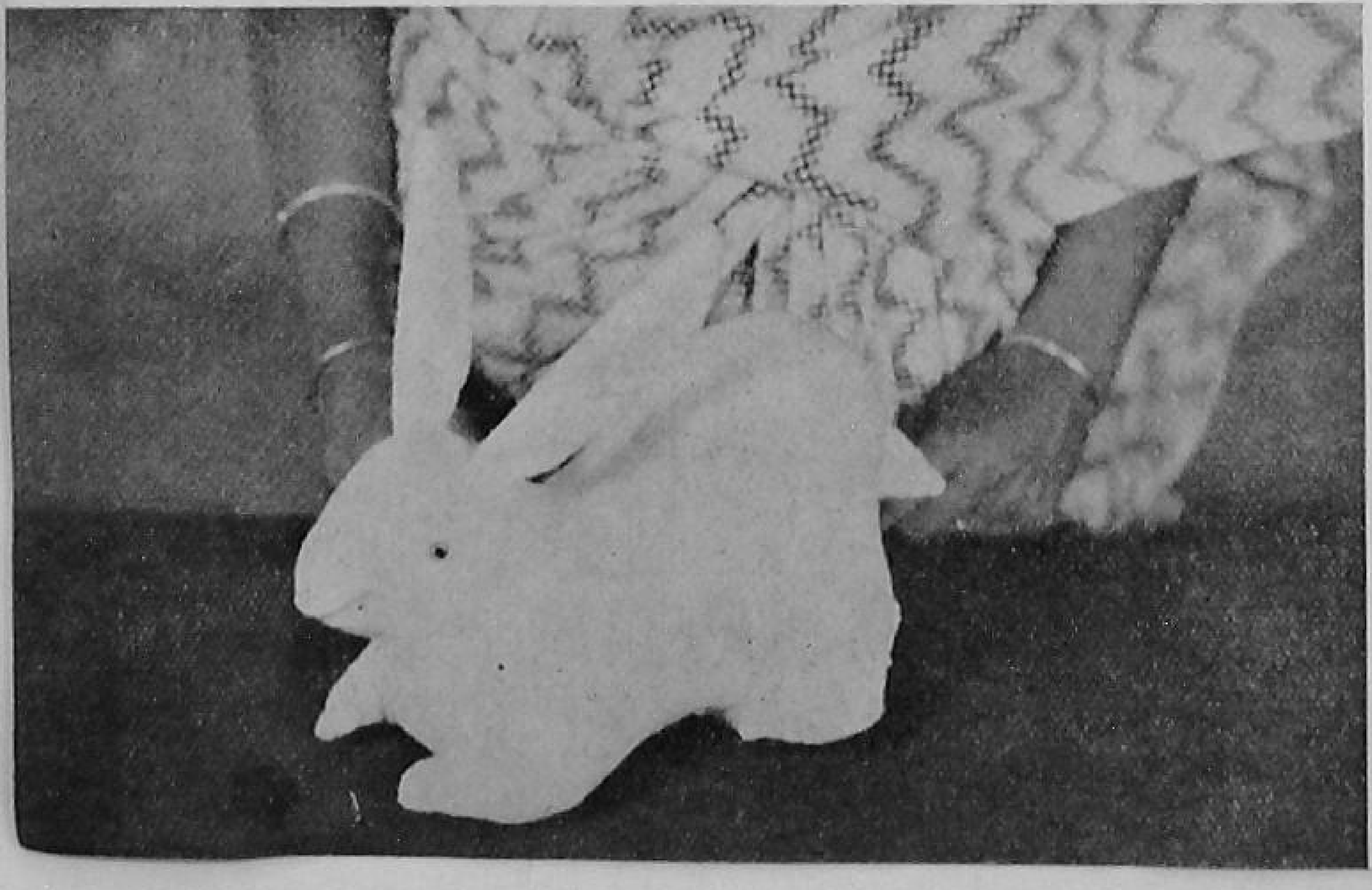
Stuffing the rabbit

Stuffing the ears and fixing them on the body

Then comes the ears. Turn the cut pieces right side out and fill them with cotton. Sew them up to the body very firmly with the coloured stranded cotton.

Mark the position of eyes with a piece of chalk and then fix the beads in place very firmly, so that the child may not easily remove them. First embroider round the eye with coloured stranded cotton, and then the mouth with black stranded cotton.

The bunny rabbit is ready now for your child to play with.



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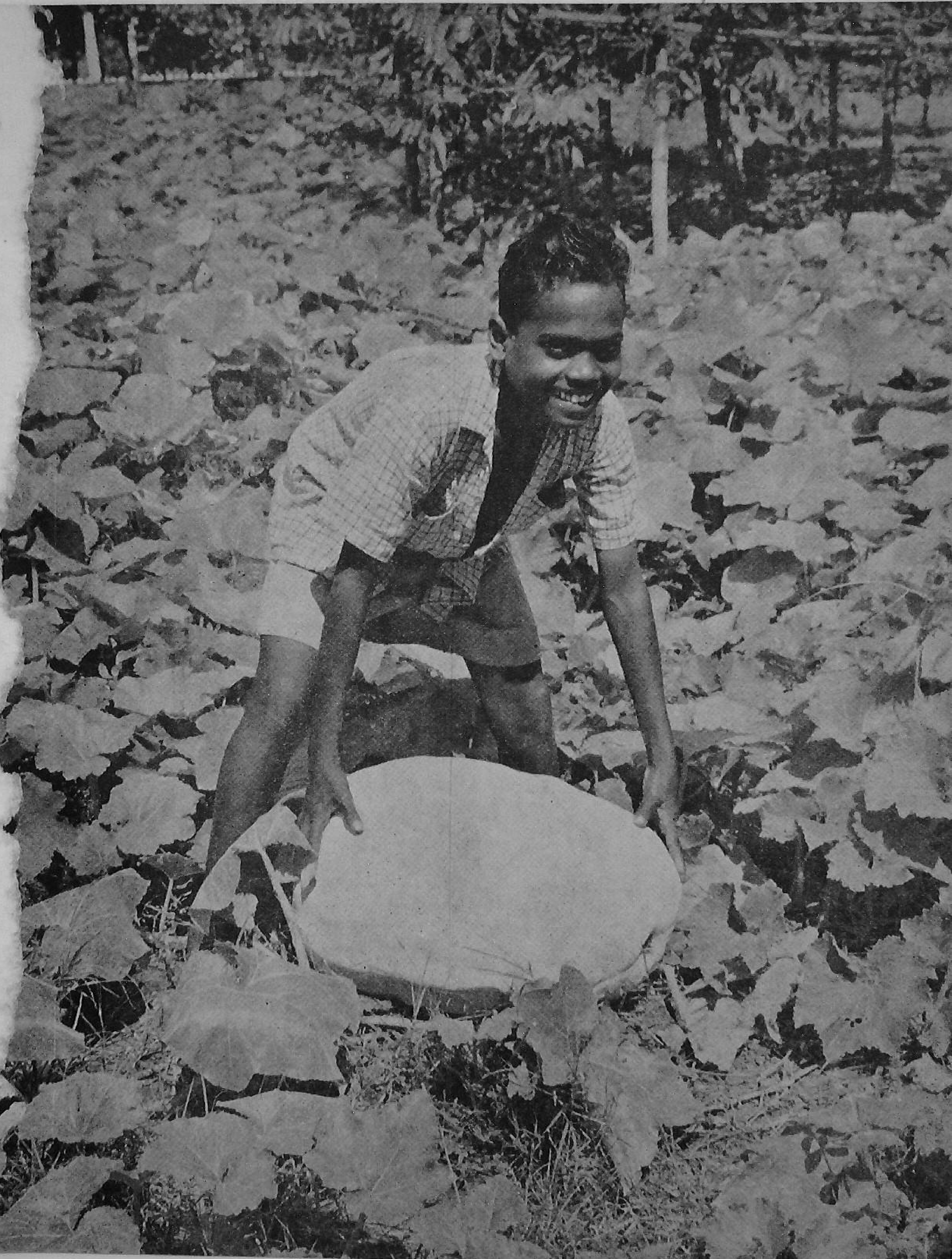

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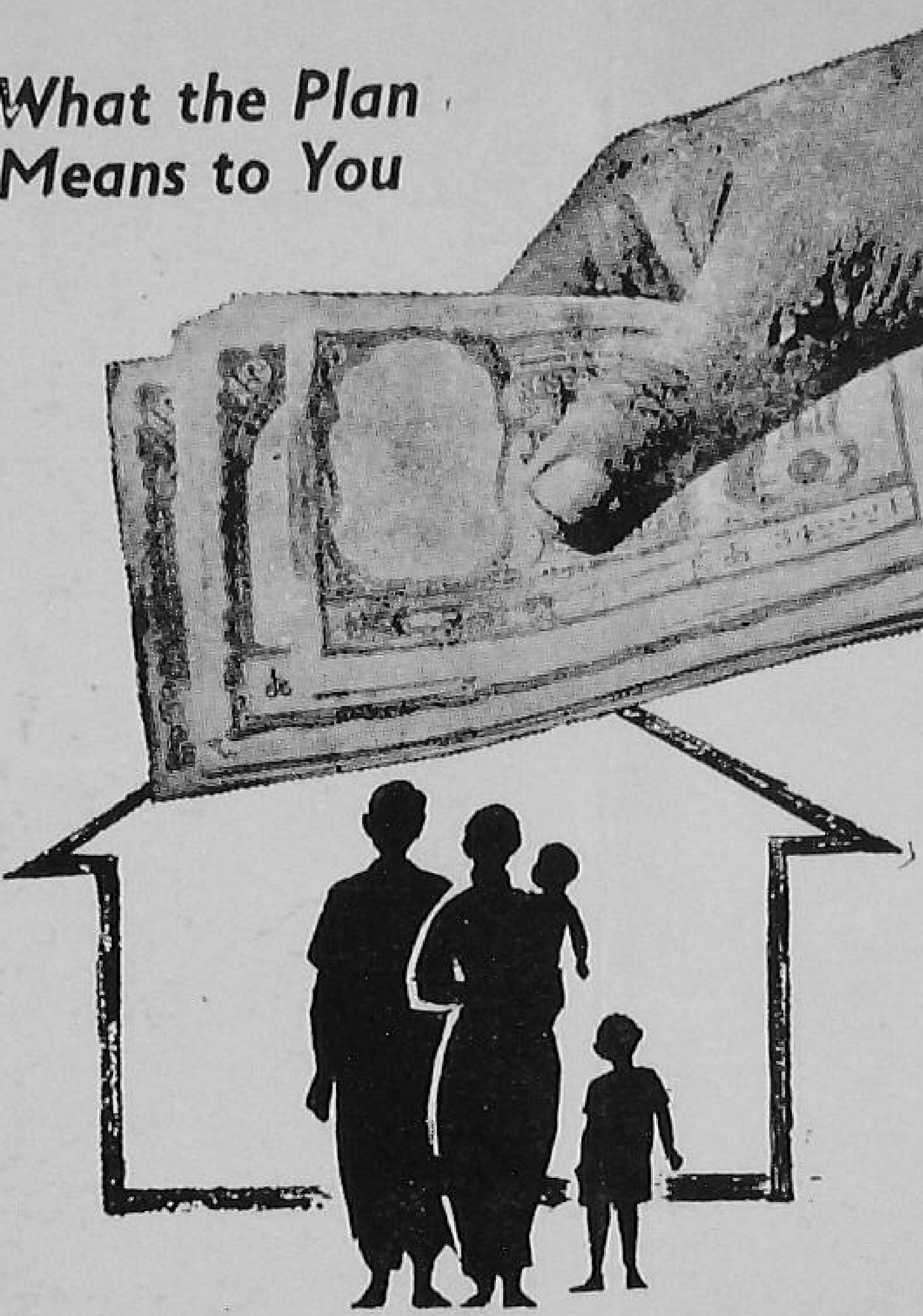

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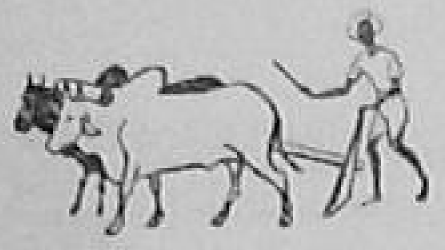

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Protect your soil
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Getting good gram yields
The way to higher wheat yields
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How to make paddy straw a better cattle feed
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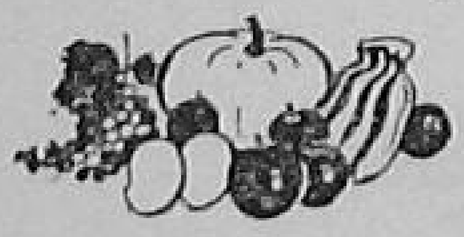

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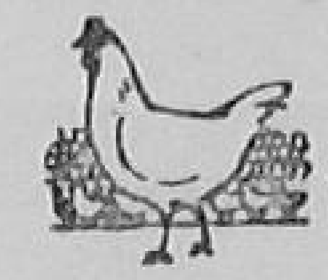
Drumstick, the year-round vegetable
Growing grapes in south India
Rabi vegetables—grow them this way
How to grow paying pineapples



POULTRY

How to fight coccidiosis in poultry
Protect your poultry birds against Ranikhet
Save your fowls from tick fever
Fighting fowl pox in poultry
How do you transport your poultry birds ?
Watch out for pullorum
Culling poultry for profit
How to make a brooder for your chicks
How to start a poultry farm
How to control lice on poultry
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Your chickens and infectious coryza
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Photo by M.G. Kamath

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THE FARM AND FARM HOME MAGAZINE

Vol. II March, 1962 No. 9

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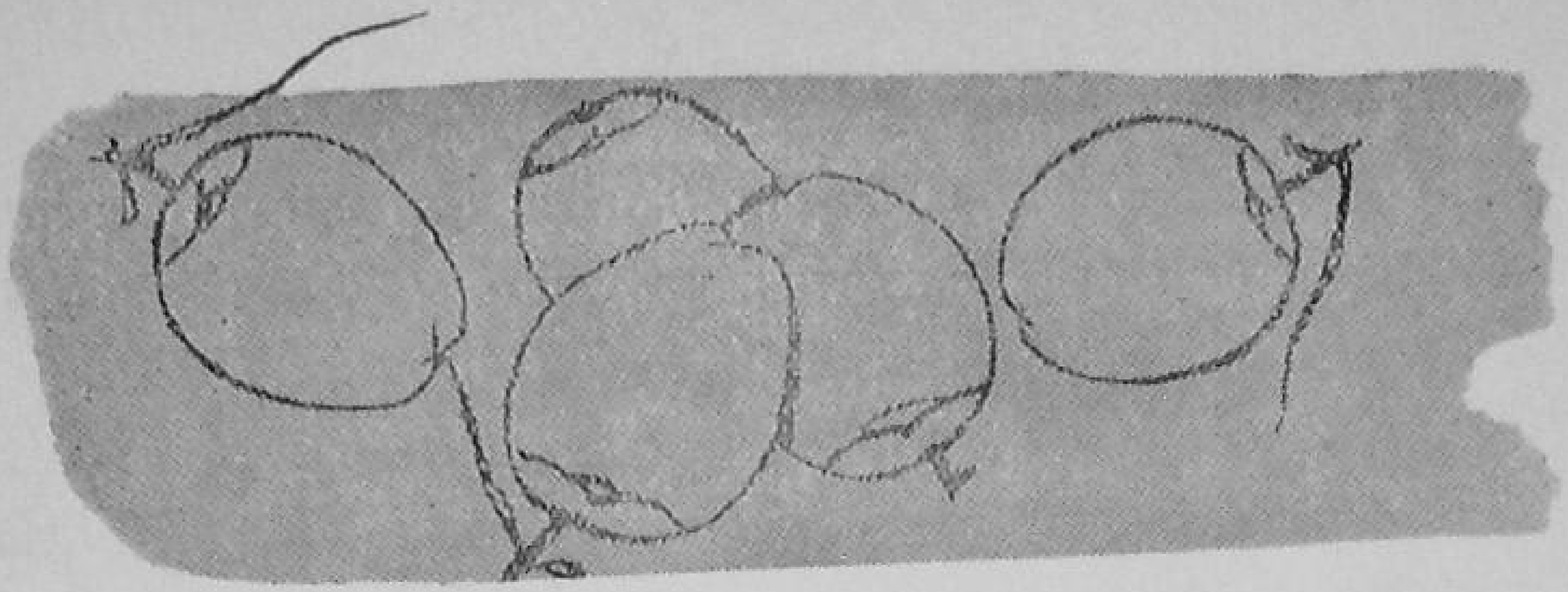
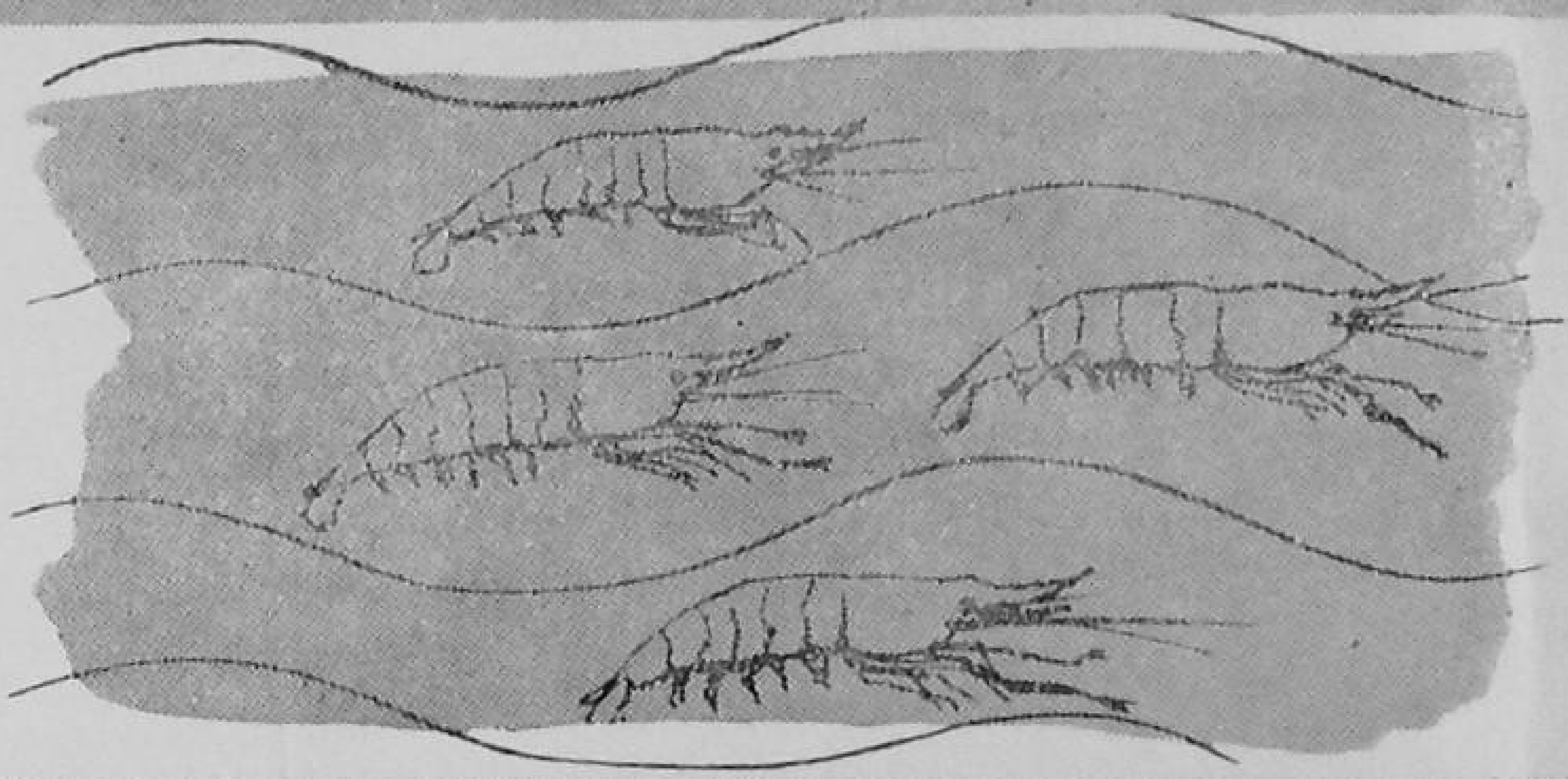




By N. B. NAIR

THE PAYING PADDY-FISH-COCONUT COMBINATION

AN interesting form of mixed cultivation can be found near Paru, in the north-western part of Travancore in Kerala. Paddy, fish, and coconut are being raised from a single holding.

Fields are near the lakes, and the soil, which is almost all clay, turns brackish during the months of October to May. So, only one crop is possible. The bunds, protecting the fields from the lake, are broad and strong

and all along their length are planted with a single row of dwarf coconut trees. No bullock has ever set its feet in the field! The plough, manure, and insecticides are not used at all. Still the farmer gets a handsome profit and plenty of leisure too!

In May, the fields are hacked up and the soil turned using the long-armed *thoompa*, the local version of the shovel. Shallow canals and low bunds are made in the field. The protective bund and spillway are strengthened to withstand the fury of the monsoon.

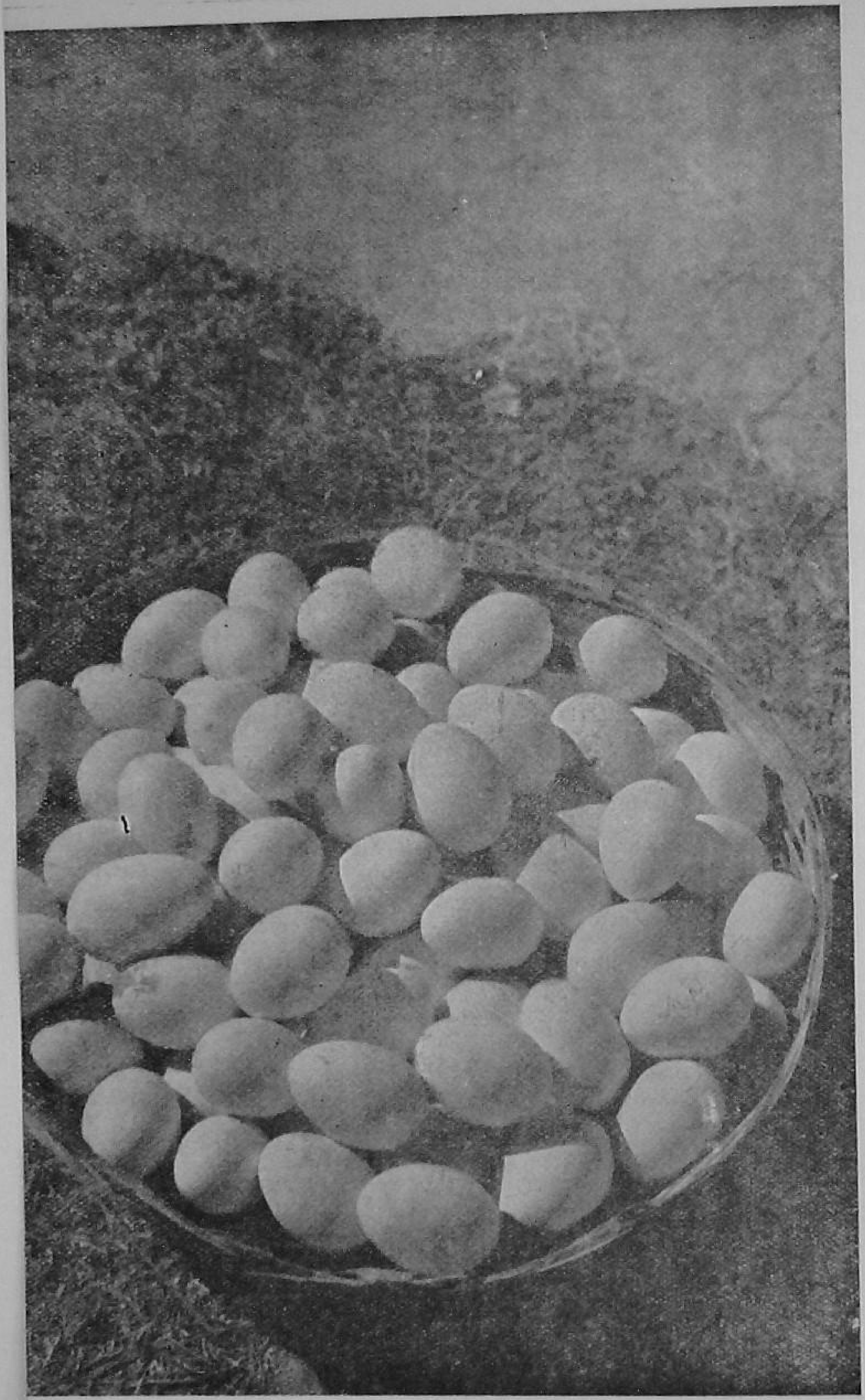
When the first rains of the south-west monsoon leaches out the salinity from the soil, the farmer starts preparing the paddy field for sowing. The only type which thrives under these conditions is the local variety known as '*Pokkali*' in Malayalam. It is a coarse-grained variety. The seed is tied up in baskets woven out of green coconut fronds and plugged up with stocks of plantain leaf. Dozens of such baskets are strung on a coir rope, and dipped in a pond overnight. After two days, the sowing is carried out. The right amount of rainfall is of utmost importance at this stage. Gentle showers of short duration are helpful. But no rain or too much of it, takes a heavy toll of the seedlings.

September-October is the harvest season. The best yield is never more than 1,500-1,800 pounds per acre. It is true that the rice is not very tasty and cows do not like to eat the straw until they are accustomed to it. But then the farmer does not have to own bullocks or buy any manure and insectcides. This kind of paddy is not usually attacked by pests or diseases. A few hired labourers during the preparation of the field, and later for the harvest are all that he needs for his farm.

After this single crop of paddy, the whole farm is turned into a fish-pond. Prawns are plentiful in the lake at this time. The spillway is kept closed till the high tide is at its highest, and then it is opened. Water rushes in, bringing the prawns into the field. The water-gate is then closed up for some days till the fish grow up to proper size. Then, a large net is fixed at the gate. When the low tide reaches the lowest, the gate is opened. Water rushes out and the fish get caught in the net. These are then collected, boiled and processed. Most of it is exported.

The coconut trees on the bund yield well. But the nuts are small in size. Once in two years, river sand is placed around each tree. Nuts are gathered ten times a year.

The following figures are taken from the farm accounts of a typical, orthodox farmer, who owns six acres. He gets about 10,000 pounds of paddy valued at 3,000 rupees. The income from the 7,000 coconuts, he gets each year, is about Rs. 1,000. He does not like to attend to the fish-farm and so rents out the field to contractors during that season (November to May). The contractors pay him 1,000 rupees. Of course, if the farmer himself attends to the fish-farm, he could get a sum much more than this amount. Thus, the total income of the farmer from the three sources comes to 5,000 rupees. He never spends more than 500 rupees a year. This includes hired labour for preparing the field, strengthening the bunds, collecting coconuts etc. This works out to a clean profit of at least Rs. 4,500 a year. Not so bad when one remembers that he need not own bullocks for the plough, or spend anything on manure, insecticides, etc! Moreover, he has about six months of leisure during the year, which he can utilize in some other side-line.



WITH the coming of summer, poultry farmers face the usual problem of low egg production in their flocks.

Birds hatched in January and February start laying by August-September, and continue to lay well through the

YOU SHOULD GET MORE EGGS THIS SUMMER

By S.G. IYER

winter months. When the summer comes, however, the poor producers among them and those which put on fat stop laying. It is only a few that continue laying late.

Similarly, the newly-hatched pullets of the year start laying towards the July end or beginning of August. Hence, there is a gap of poor production between April and July.

Egg production depends on many factors. The breed no doubt is important, but there are other factors such as sunlight, housing, feeding and management which also count. With good feeding and management, egg production can easily be raised from 80 to 90 eggs per year per bird to as many as 200.

FEEDING

To lay well, birds must be given proper feed. Sometimes, one or more essential foodstuffs going into the mash or grain mixture, such as wheat bran and yellow maize, are not available. Then the poultry farmer must find other equally good substitutes, so that the feed given does not turn out to be inferior. If the feed is suddenly changed, birds go off laying. Some of them may even go in for early moulting in summer.

In summer, birds do not eat as much as they do during the rest of the year. If you feed a dry mash during summer, birds will not consume much of it. Hence, sprinkle some water on the mash and mix it well. A wet mash with cooked meat offal is a very good feed. You can add the meat offal to dry mash also for feeding birds at about ten in the morning. Provide good quality limestone grit containing 98 per cent calcium carbonate.

MANAGEMENT

From the middle of March in north India, the summer season starts. Temperatures are high during April, May and June. It is during this period that the poultry farmers should be very careful. It is usual to see birds standing with the wings spread and beaks open and often panting. This is a sign of the bird trying to keep itself comfortable in the heat. The poultry bird has a high body temperature. It has no sweat glands. Hence, it is necessary to protect it from the extreme heat.

If poultry houses are of angle iron bars covered with wire netting, it is easy to keep the house cool if a large *bhurra* grass *chupper* is put over the roof. The windscreen must be strong enough to break off the hot westerly winds. It is also good to sprinkle water over the screen and splash water frequently in the pit as well. Some poultry keepers even sprinkle a little water over the birds. All these will help keep the birds cool. It is a good practice to have shade trees such as the mulberry. For a pen of 100 feet x 100 feet, eight such trees will be found sufficient. These trees, if pruned early in October-November, put on a thick foliage in next March.

In summer, enough number of nest boxes should be provided not only in the pen, but also outside it. If the poultry keeper provides trapnesting, he should see that the birds are released as early as possible after laying, as otherwise it is likely that the eggs will be broken.

During summer, provide also more hopper space to each bird. Also provide cool, clean and fresh drinking water. Change water every four hours during the day. Good quality limestone grit is very necessary to be given for better egg production.

BROODY BIRDS

Broodiness in birds is useful for hatching eggs. But the broodiness is also a handicap. When a bird goes broody, she produces eggs with a small and shrunken yoke. You can break the broodiness in birds, and make them lay well, if you confine such birds, once they stop laying, in special broody coops with a slatted floor through which cool air can circulate. This way, a bird gets over its broodiness in a week or so. If you feed such birds with a diet rich in protein such as a wet mash, it will help the birds start laying early.

In the hot weather, laying birds commonly get diseases, and many of them die off, or lay poorly as a result. Fowl cholera and fowl pox are two of the common diseases. Birds may also get heat strokes and similar other ailments.

(Please turn to page 19)

It was lindane that made all the difference. The sugarcane on the left did not receive lindane treatment, while the crop on the right did

WHAT LINDANE CAN DO TO SUGARCANE

IN one of the fields at the Sugarcane Research Station, Jullundur, Punjab, a visitor can see some rows of cane, growing very much better than in the neighbouring rows.

The canes were healthy and tall, with a large number of stout canes growing closed together. In the rows on the left, the canes were all short and thin and gappy, with many 'dead hearts' or dead central shoots.

Looking at the good canes, you would think that they came from more vigorous-growing variety, which received heavy manure. But, on an enquiry you would find you were wrong. All the rows in the field and the next were of the same variety, and received the same dose of fertilizers.

A chemical, called lindane, that was applied to the one set, protected the canes against white ants and shoot borers. Lindane, a purer form of BHC, was sprayed on the cane setts when they were planted, whereas the cane rows on the left side were not lindane treated.

Lindane is a powerful insecticide. It is effective against both termites and white ants and shoot borers of young cane. White ants do a lot of damage to the tender sugarcane buds. Sometimes they destroy as many as 40 to 60 per cent of the eyebuds. Lindane protects the buds, and gives almost every mature bud a chance to germinate and grow into a cane.

Shoot borers too are very fond of young sugarcane. They bore into them and kill the growing shoot. The canes develop a 'dead heart.' In some cases, nearly 30 to 50 per cent of sugarcane tillers are killed by these borers. Because lindane effectively destroys the borers, the canes put forth a good number of tillers which grow into fine juicy canes.

In an experiment in Uttar Pradesh the number of tillers in a lindane-treated plot was 96,700 per acre as against only 40,100 in the plot that did not receive lindane. Such is the protection that lindane gives to cane.

Lindane also is seen to help canes grow. Farmers in the Punjab who used lindane even call it a fertilizer! In trials conducted at Rosa (Shahjahanpur, Uttar Pradesh) in 1958, the sugarcane yield from plots that received lindane was as high as 1,032 maunds per acre as against 362 maunds from the plot that did not receive it. The average height of the cane in the first was 7½ feet, while in the second, it was only 3¾ feet.

Lindane-sprayed canes are also found to be richer in sugar content.

You require half a gallon of the chemical, costing about 30 to 33 rupees, to protect an acre of sugarcane but you will get it all back many times over because of the better sugarcane and the higher yield it will produce. In the Punjab, some sugarcane societies and factories help farmers meet a part of the cost of the chemical.

You get lindane in the form of an emulsion. Take half a gallon of this liquid and mix it with 160 gallons (40 kerosene tinfuls) of water. After you spread the cane setts in the furrows before planting, spray this mixture on the setts with the rose can.

This lindane spray will effectively protect your sugarcane against white ants and shoot borers, and give you more and better sugarcane. Try it this year.

Growing

KAGZI LIME

By L. VENKATARATNAM

KAGZI lime is a fruit that is growing more and more popular with fruit-growers as well as kitchen gardeners. To raise a good crop of *kagzi* lime, you will have to pay attention to where and how you grow it.

WHERE TO GROW

Soils which are six feet deep having silt or medium black loams are the best for growing *kagzi.* Loose, fine-textured red soils come next in preference. The soil should be able to hold moisture and should be well-drained. Avoid heavy clay soils for *kagzi.*

VARIETIES TO GROW

The thin-skinned round *kagzi* lime (*Pulla nimbu*) of Kodur (Andhra Pradesh) is the popular variety to grow in south India. This variety is juicy and yields 1,500 to 2,000 fruits a year per tree. The Rajamundri lime produces only 500 to 600 fruits per year. But the limes are big-sized.

HOW TO PLANT

First provide a shelter-belt for the plants. Use *shisham*, *Casuarina*, *Glyricidia* or any other shade plant for the purpose.

Mark three feet by three feet squares at every 18 to 24 feet (each way). Dig three feet deep pits at these places.

Fill each of these pits with 20 to 25 baskets of cattle manure and six seers of powdered castor or *neem* or groundnut cake, and three seers of fish-meal. Put in two to three baskets of river silt, if available, or else apply top-soil. Plant one-year-old *kagzi* lime seedlings which are two feet high. Two-year-old lime seedlings can also be planted. Avoid planting budded plants obtained from areas known to have virus-affected plants.

Plant in June-July or November-December. Plant seedlings with a ball of earth, at the centre of each pit. Press the soil firmly round each plant with the feet. Check and see that all the plants are in straight lines either way.

Your seedlings will grow slow in the first five years, but will give you the same results afterwards as budded plants do. Of course, budded plants start yielding two years earlier than the seedlings. Till they start yielding, grow *dhaincha*, sannhemp, green-gram (*moong*), groundnut and vegetables as intercrops. You can also grow turmeric, ginger or onion, but not rice, *jowar* or cotton, as they may shade the fruit plants.

In June, plough the orchard with an iron plough and sow sannhemp or *dhaincha*. Plough the crop down after six to eight weeks of growth. In July and December, apply the manure to each plant by digging three to four inches deep around them. The manure you apply per plant should be 10 baskets of cattle manure, 3 kilograms of groundnut or castor cake, 1½ kilograms of superphosphate and 1⅛ kilograms of ammonium sulphate. Irrigate immediately after manuring.

Apply this dose during the first five years ; from the sixth year onwards, increase it by a fourth every year.

HOW TO IRRIGATE

Irrigate lime at one-acre-inch per irrigation. Apply the water once in five or seven days in square basins around the plants. Do not allow the water to come in contact with the stem, by rolling up soil a foot away from the plant to form a circular mound. Every year, increase the basin by one foot and reform the mound of earth one inch higher. During the rains, drain all the extra water. Do not use salt water for irrigation.

HOW TO PRUNE

Avoid severe prunning. In the early stages, let a single stem grow with branches going upright. A year after planting, trim the low hanging branches and keep the same clear to a foot from the ground level. In this area, remove any sprouts that may come up.

(*Please turn to page 25*)

An implement which strains the animals is a bad selection

Suit the implement to the bullock—so that both the animal and the implement work efficiently

HOW TO SELECT THE RIGHT IMPLEMENT *for your farm*

By K. S. YADAV

FARMERS often complain that when they use an improved agricultural implement like a mould-board plough or cultivator, the working life of the bullocks is shortened. This is true in cases where no thought was paid by the Extension worker or the farmer in selecting an improved implement after paying attention to its suitability to the animals the farmer has and the soil condition in which it is worked.

It is necessary that Extension workers, agricultural officers, farmers and village artisans know the various things to be considered before a new improved implement is purchased or introduced in the area.

First, they should know how to find out the pulling capacity of the bullocks or animals yoked to the new implement. This capacity is found out from the formula that an animal can exert a normal pull of 1/10 to 1/8 of its body-weight for a normal load for 8 hours per working day with rest inbetween. If an animal has a body-weight of 800 pounds, for example, it can take a draft (or pull) of 80 to 100 pounds only. Hence, a pair of bullocks with such a body-weight can take a draft of 160 to 200 pounds. Therefore the implement you select for use with these bullocks should not have a draft of more than 160 to 200 pounds. If it is more, the bullocks may still work the implement, but their general health and working capacity will suffer in the long run. To measure the draft, an instrument called a spring-type dynamometer can be used.

All soils offer resistance to the working of an implement, the resistance depending upon the kind of soil. The soil resistance or draft is the force required to shear and pulverise one square inch of the furrow cross section from the parent material. Generally, this varies between 3 and 12 pounds per square inch. The draft of the plough per square inch of furrow cross section for various soil types, generally speaking, is as given below.

Type of soil	*Pounds of draft per square inch*
Sandy	3 pounds
Sandy loam	3 to 6 pounds
Silt loam	5 to 7 pounds
Clay loam	6 to 8 pounds
Heavy clay	7 to 12 pounds

The above shows that the draft of the plough varies directly according to the depth and width of the furrow. Experiments have shown that in a plough draft made by cutting the furrow slice, independent of turning, 45 per cent of the total draft was used in cutting the furrow slice and 34 per cent of the draft in turning the furrow slice. Another 21 per cent was used in moving the plough.

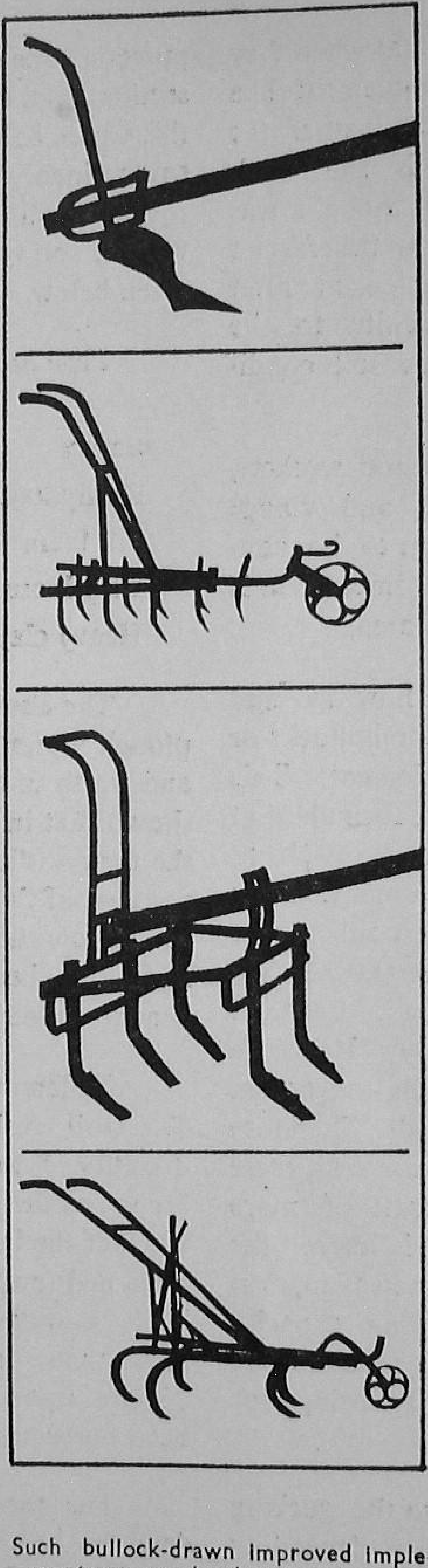
Different soils have different drafts. The soil resistance also depends on the quantity of weeds in the field. If the weeds are more, the draft increases. This is true whether the land is a ploughed or an unploughed one. The draft of the ploughed land, however, is smaller than that of the unploughed land. Soil resistance will also depend upon the previous crop which has been harvested from the field.

The farmer should also know how deep he has to prepare the seed-bed or the field. Then he should find out the furrow section which he wants the implement

to make. He can then calculate the area of the soil to be stirred.

There are two types of furrow sections which implements can make; rectangular and triangular. The rectangular type is the one which all soil-inverting ploughs make. The area of this section can be calculated by the size of the share of the furrow width in inches multiplied by the depth of furrow in inches. This again should be multiplied by the approximate soil resistance, so that the total draft of the implement can be worked out.

If the furrow section is triangular as is made by the *desi* plough or other implements like cultivators, you can calculate the area of the furrow slice by half the base into altitude (height). This means you multiply half the width of the furrow on the ground surface by the depth of the furrow. This area multiplied by the soil draft will give you the total draft of the implements. This will be for one furrow. If the implement makes more than one furrow, multiply by the number of furrow openings to know the total draft of the implement.



Such bullock-drawn improved implements are good only when they are properly chosen

This approximate draft should be less than the pulling capacity of the bullocks. Hence, select the size and type of the implement only after knowing the source of power that is to operate it.

One cannot ask farmers in West Bengal, Orissa, and Assam to use the Victory plough or the Punjab plough. This is because the bullocks in these areas are short and may not weigh more than 500 pounds each. A pair of such bullocks can exert a pull of only about 100 pounds. Hence, heavy implement should not be matched with these bullocks. Only very small type of ploughs and implements, having no more than 100 pounds draft are suited for such animals.

Extension workers who have to demonstrate and popularise the right type of implements, and farmers who want to purchase and use such implements should, therefore, consider these factors before they go in for improved implements.

No jassid trouble if you

SOW YOUR COTTON EARLY

JASSIDS, a pest that reduces long-staple cotton yields, are a worry to farmers in the Punjab. Agricultural experts now say that the jassid trouble can be easily reduced if farmers sow their cotton early.

Early sowings also help you in other ways.

An early-sown cotton gets a better start. You will have time enough to give one or two interculturings before the monsoon sets in. These interculturings will keep down the weeds and push up the growth of cotton plants.

The early-sown cotton gives you more cotton per pound of fertilizers added to the soil. It uses up the nitrogen you supply through the fertilizers better than the late-sown crop.

The early-sown cotton will be healthier than a later-sown crop. Leaf rollers do less damage when cotton is sown early.

If you are in the Abohar region, sow your cotton any day during May, but if you are in the Jullundur region, you should start sowing from the second week of April and complete it by the second week of May. In the Hissar region, the best time to sow cotton is between the second week of April and the first week of May.

If you have to delay the sowing, sow the seeds in rows two feet instead of two and half feet apart which is the correct spacing for an early-sown crop. Whether early or late, keep the distance between plants in the row at one foot.

The cotton crop grows better if your field is green manured with *guar* or gram or any other legume. Apply, if possible, eight to ten cartloads of well-rotted cattle manure for each acre.

Sowing mixed and impure seed is banned in the Punjab. You should obtain quality seed in sealed bags from the Agricultural Department. By sowing such seed, you can keep your cotton pure and uniform. Remember, a pure and uniform quality cotton brings you more money per maund. Eight seers of good seed are enough to sow an acre. You may increase the seed-rate by another two seers if your sowings are delayed.

Soak the seeds for five to six hours in water before sowing. This will help the seeds to germinate better.

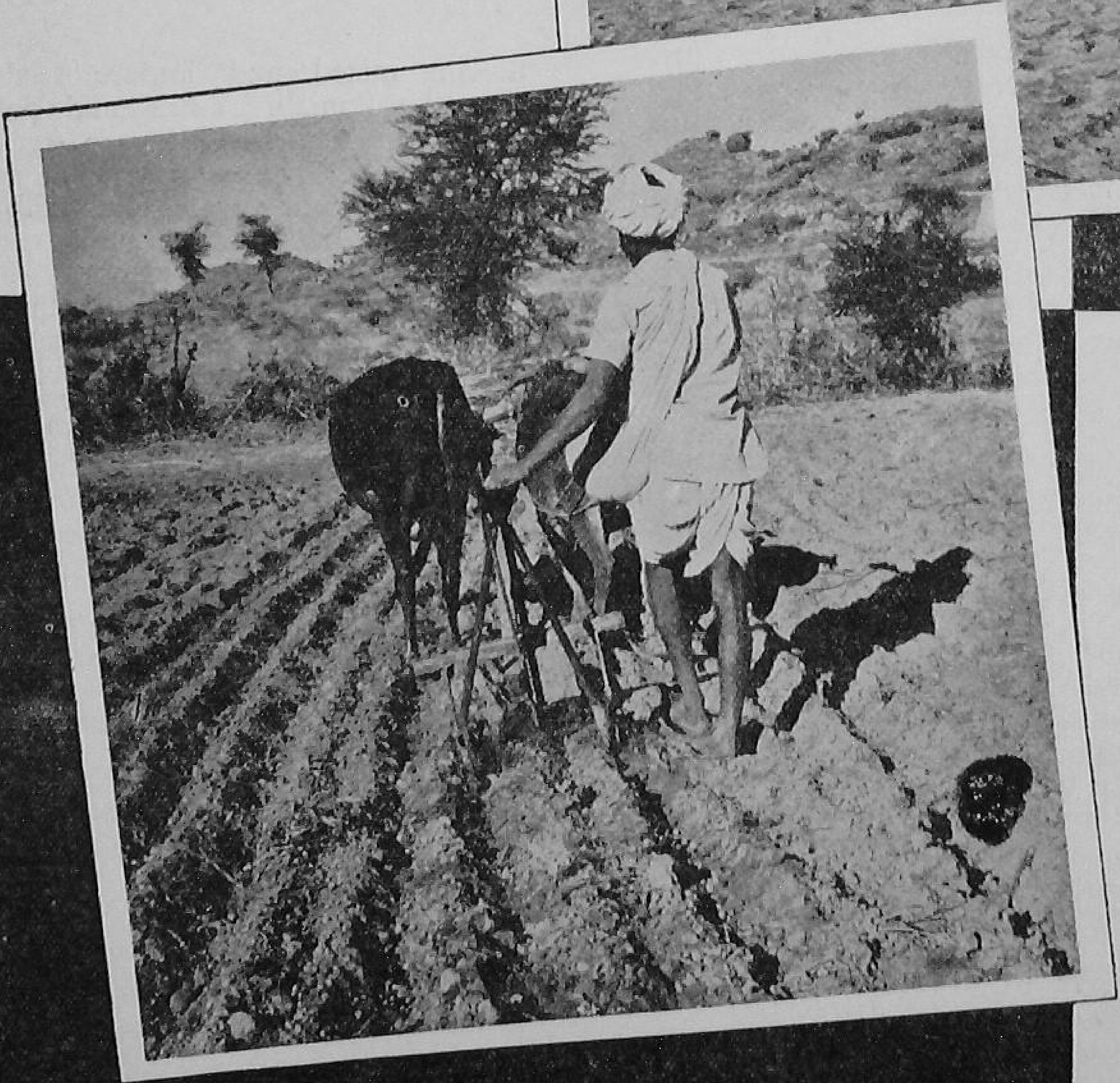
Rub the soaked seed with sand at the time of sowing. This enables the seed to pass through the drill smoothly and helps you sow the crop uniformly in the field.

Use the single-row cotton drill for sowing. The work will be cheaper, faster and more efficient.

If you are sowing *LL 54* variety of cotton, treat the seed with 'Ceresan' or 'Agrosan GN.' You require half a *chhatak* of it to treat eight seers of seed.

Special Farm Feature

Farmers in Pali are now happy as they are able to harvest bumper crops and at the same time get good price for their produce through cooperative marketing societies established under the Programme. Picture shows chillies being weighed in the chilli-drying yard of a marketing society.



Many Pali cultivators have taken to improved implements. Here a farmer is seen using a three-tined seed-drill.

More and more farmers are using fertilizers, as they are now liberally available. Picture shows a Pali cultivator applying ammonium sulphate to his wheat crop.

PALI'S PROGRAMME

A year of intensive efforts towards increased production

THE day dawns in Pali District in Rajasthan the same way as it has been all these years. But to the Extension Officer Jagdish Vyas, a new day means a challenge to do more work with farmers, assisting them in drawing up plans for better farming and helping them implement the plans.

Vyas, like 40 other Agricultural Extension Officers in the District, since about a

Potato—a new introduction in the area—has evoked lot of interest among Pali farmers.

year, is leading a new way of life. He lives in Bar village in Raipur Panchayat Samiti area, instead of at the Samiti Headquarters, from the time the Intensive Agricultural District Programme was launched in Pali.

Pali is one of the seven districts in the country where this Programme, popularly called the 'Package Programme', is at present being implemented. The Programme aims at a rapid increase in food production in selected areas by providing farmers with all the requisites of production in the quantities needed and at the proper time.

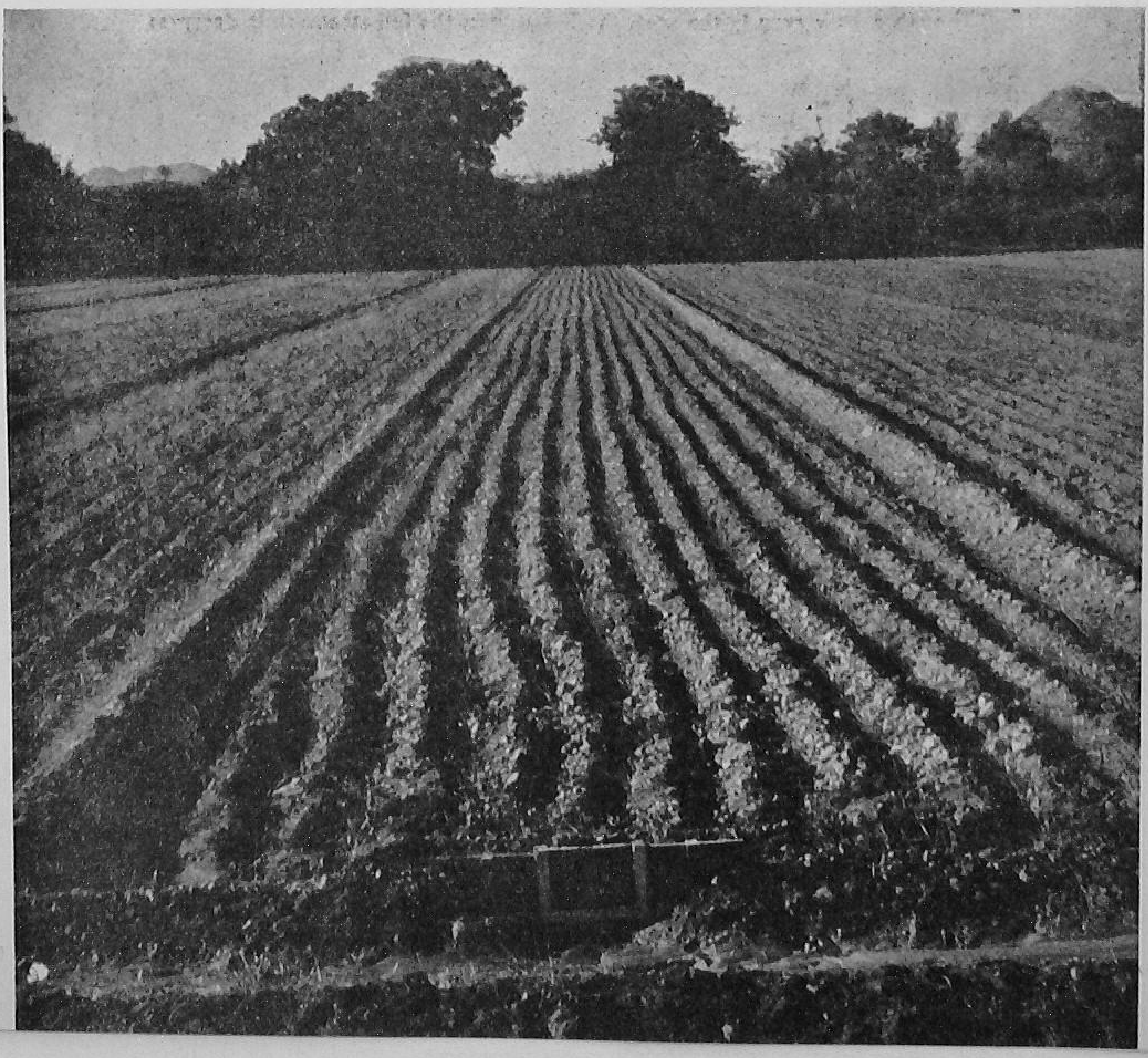
The idea behind Vyas preferring to live in Bar village is that he can get better acquainted with Bar farmers, understand their day-to-day problems and be immediately available when they need his help. This way, he has been able to identify himself with the farmers and influence them into taking up the 'package of improved farm practices.'

Vyas has another challenge to meet. He has to practise what he preaches. If he advises and induces farmers to introduce improved practices, he has himself to follow these practices in a portion of a field belonging to a farmer in Bar. The farmers can be easily converted in favour of the better practices if the yields he gets are better than what the farmers harvest.

In Pali, the accent is on providing the farmers with the factors which make for better farm yields. Speedy action is being taken to see that every farmer gets for sowing, the improved seed which is the basic need for raising a better crop, whatever the crop is. In the last *kharif*, over 9,000 maunds of improved seed of *jowar*, maize, cotton, *bajra*, and sesamum were distributed to farmers. To speed up improved seed production, two large seed multiplication farms have been set up and one more is planned.

Pali farmers, especially those in the rainfed areas, were not fertilizer-conscious. Last *kharif*, they had their first introduction to fertilizers, when they used 700 tons of ammonium sulphate and 300 tons of superphosphate. Yield-increases showed them what they had lost all these years. During

Composite demonstrations influenced many a farmer take to better farming methods



rabi, Package Programme officials doubled the fertilizer supplies, and found that there was demand for more.

In farmer Dhaglu's words, "For the first time this year I used fertilizer in the full dose recommended for my chilli crop. Inspite of heavy rains at the wrong time, I got 15 per cent more yield. I am now all for fertilizers."

Better farming has to go hand in hand with better implements. Extension workers are showing farmers the use of medium and light soil-turning ploughs, bund-formers, *triphalis* improved-hand hoes, bar harrows, *bakhars*, soil-scrapers, three-tined cultivators-cum-seed-drills, etc. Nearly 1,500 of these implements are being worked in the fields for educating farmers in the use of such implements. The Package Programme officials are encouraging village artisans to manufacture and sell them to farmers by subsidising their cost.

Easy credit, which was for decades one great unsatisfied need of the farmer, is being

Though a new crop in the area, the potato gets the full attention it deserves

satisfactorily solved. Short-term loans, amounting to 10½ lakhs of rupees were disbursed to Pali farmers through cooperatives. The cooperative societies are being strengthened, and in the last one year, 400 new primary agricultural credit societies have come into being. Membership to the societies as a result of intensive work, has increased four fold in the last twelve months !

The credit needs of farmers are based on what they propose to do on their farms. For this purpose, each farmer is assisted by the Programme staff to draw up a farm production plan. Last year, 7,000 farm plans were ready; in the coming year, this number will be more than doubled.

Education to be effective among farmers has to be visual. A field demonstration is one way of showing farmers what they should do and how. In Pali today, farmers are closely watching over 525 demonstrations conducted by the Extension people. When the fields are harvested, farmers will see for themselves what it means to take up the better farming practices.

Typical among the new converts to better practices is farmer Gopuji. He is the one that doubted whether it was worthwhile to accept a new idea. A close watch of the demonstration plot in his own field has now convinced him that improved practices alone can deliver the goods for himself and all other farmers of Pali.

It is a year now since the Package Programme came to Pali. Pali has another four years to give a fuller account of how it has made use of its potentialities and its resources to raise the standard of agriculture to a high level.

GET MORE EGGS THIS SUMMER

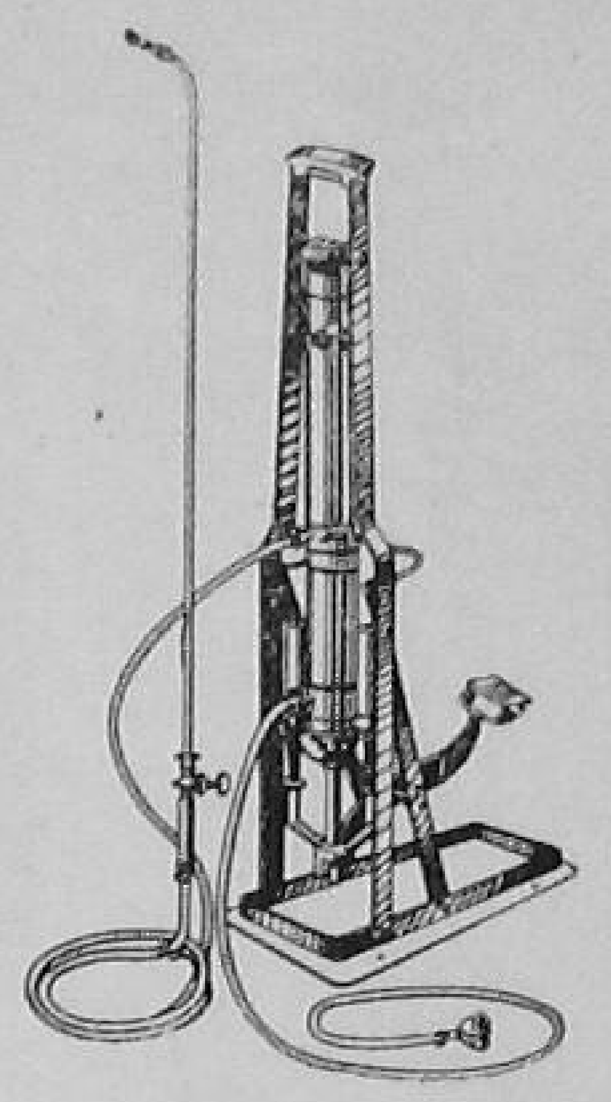
(*Contd. from page 5*)

When birds are confined or overcrowded, the worm trouble also starts. This is more so during summer. The poultry keeper would do well to get the necessary help from the nearest veterinary hospital in such cases. The birds should also be treated with DDT for lice. The poultry keeper should do everything to see that he maintains good sanitation.

To get equally good production in summer as in winter, it is good to hatch late in the season—March-April—when the eggs are in plenty, and also setting eggs in August to October. Egg laying of birds hatched in January and February drops to 30 per cent or less in the next May-June, while the late hatched onces will be in high production during this period. The early hatched birds of September-November come into lay next March-April, and will maintain good laying all through the summer.

With proper housing and management and an eye on diseases, poultry keepers can easily maintain good egg production in their flocks even during summer.

ENSURE IMMUNITY
FROM INSECT PESTS
SPRAY WITH



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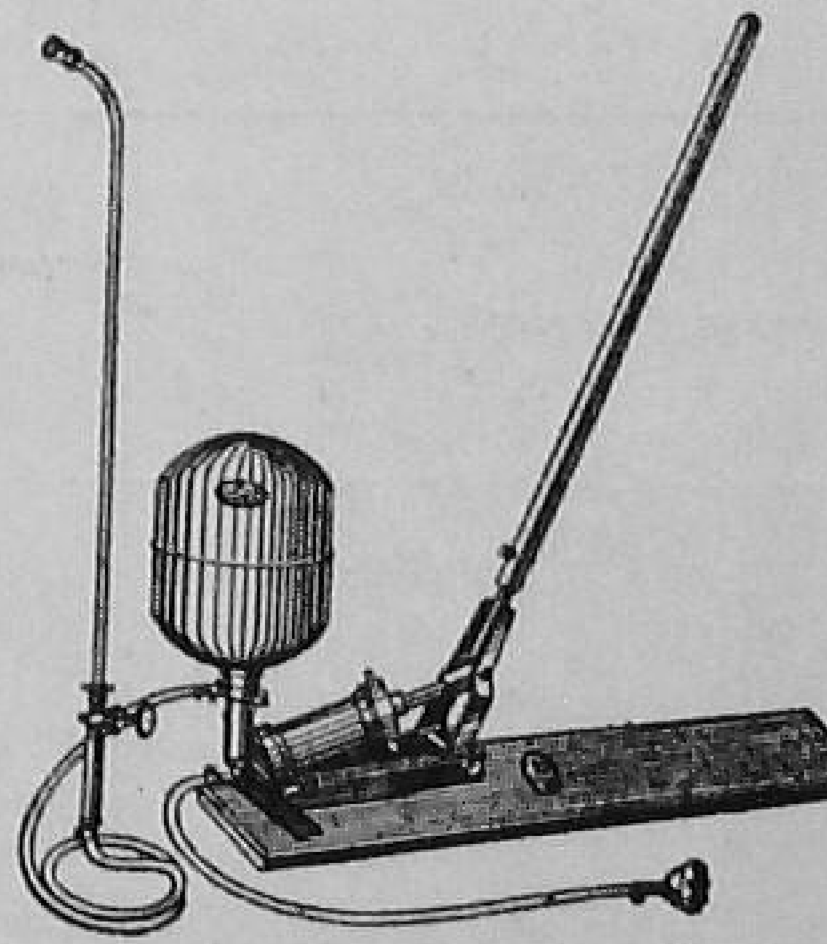

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The Punjab Farmer's FERTILIZER GUIDE

Fertilizers are to be used in a proper way and in time. Here is a guide that Punjab farmers can follow with profit.

Region/District	*Dose in pounds/acre* N	P_2O_5	K	*Time and method of application*	*Remarks*
			WHEAT		
Hoshiarpur, Gurdaspur, Ambala, Patiala, Kapurthala, Ludhiana, Jullundur and Hissar	40	20	20	Half N and whole of P and K by drilling at sowing and the remaining half of N by broadcast with first irrigation.	(a) For soils with *p*H less than 6, liming at 400 to 1,100 pounds per acre depending upon *p*H and texture is necessary.
Kangra	40	40	40	-do-	(b) Application of P and K where they are not mentioned may be made if so indicated by soil tests.
Amritsar, Karnal, Bhatinda	40	20	—	Apply half N and whole of P by drilling at sowing and the remaining N with first irrigation.	(c) For *C 273*, application of K is essential.
Remaining districts	40	—	—	Either drill the entire quantity at sowing or broadcast with first irrigation.	
			BARLEY		
South-eastern districts	25	—	—	Broadcast or drill at sowing	

Region/Disirict	Dose in pounds/acre N	P_2O_5	K	Time and method of application	Remarks
				MAIZE (LOCAL)	
Kangra	50	50	50	* Apply half N and whole of P and K by drilling at sowing. Apply rest of N in bands or side-dress with first irrigation.	(a) Liming is recommended when soil *p*H is below 6.
Gurdaspur, Hoshiarpur, Patiala	50	25	25		
Ludhiana, Jullundur	50	25	—		
Remaining districts	50	—	—	Either drill at sowing or apply in bands or side-dress with first irrigation.	(b) Application of P and K, where not mentioned may be made if so indicated by soil tests.
				MAIZE (HYBRID)	
All districts	100	50	50	Apply as in * above.	(c) Dose of N may be reduced to half if maize follows berseem.
				PADDY	
Gurdaspur, Karnal, Ferozepur, Patiala	40	20	20	N and K to be applied 3 weeks after transplanting and P may be drilled before flooding. N may preferably be split up in two doses, half 3 weeks and the rest 6 weeks after transplanting.	Higher dose is necessary for finer varieties.
				COTTON	
Hansi and Abohar	80 to 120	—	—	Apply half N at thinning, by drilling on both sides and the other half at pre-flowering on both sides of the row by top-dressing.	(a) If cotton follows berseem, the dose of N may be reduced.
Amritsar, Jullundur, Hoshiarpur and Gurdaspur	40	—	—	do.	(b) P and K may be applied where indicated by soil tests.
Other cotton-growing areas	50 to 60	—	—	do.	
				SUGARCANE (PLANTED)	
Jullundur, Hoshiarpur, Patiala, Karnal, Ambala (Jagadhri type II soils) and Kapurthala (Phagwara type III soils)	60 plus 40 to 80 pounds nitrogen as top-dressing.	30	30	Apply fertilizer-mixture by drilling at sowing and the rest of nitrogen as top-dressing in June.	

Region/District	Dose in pounds/acre N	P_2O_5	K	Time and method of application	Remarks
				SUGARCANE (RATOON)	
do	60	30	30 plus 80 pounds nitrogen as top-dressing.	Apply fertilizer-mixture with first ploughing in February or after harvest by drilling and rest of nitrogen by top-dressing in June.	
				SUGARCANE (PLANTED)	
For all other districts	100	—	—	Apply in two doses, half at sowing and half before the onset of rains.	(a) P and K where not recommended may be applied if indicated by soil tests.
				SUGARCANE (RATOON)	
do	140	—	—	do.	(b) Increased dose of nitrogen may be useful in very poor soils.
				POTATO	
Palampur	100	100	200	Apply fertilizers by drilling at sowing.	Spray with zinc sulphate (0.5 per cent) solution also.
				POTATO	
All other districts	50	50	50 plus 50 pounds nitrogen.	Mixture to be applied at sowing and nitrogen by top-dressing at earthing up.	
				TOBACCO	
All the districts	75	—	—	To be applied in split doses, half at transplanting and the other half one month after.	Nitrate should be preferred.
				GRAM	
All the districts	—	30 to 60	—	To be drilled before sowing.	
				BAJRA	
do.	30	—	—	Drill half the dose at sowing and the other half one and a half months after sowing at the time of irrigation. Under *barani* conditions, half the dose may be applied with the first shower of rain.	

Region/District	Dose in pounds/acre N	P_2O_5	K	Time and method of application	Remarks
				BERSEEM	
Gurdaspur	50	100	—	Apply by broadcasting before sowing.	
All other districts	25	50 to 100	—		
				SUDAN GRASS	
All the districts	50	—	—	Apply half the dose by broadcasting before sowing and the rest after first cutting.	Higher dose of N is also economical.
				JOWAR (FOR FODDER)	
All the districts	30	—	—	Broadcast at sowing.	do.
				SWEET POTATO, CARROT, BRINJAL	
For all the districts	50	—	—	To be applied at sowing.	P and K may be applied when indicated by the soil test.
				ONIONS, TOMATOES, CAULIFLOWER, CABBAGE, COLOCASIA, PEAS AND CHILLIES	
do	100	—	—	To be applied at sowing.	do.
				OILSEED (SARSON)	
do	30	15	—	To be drilled before sowing.	
				OILSEED (RAI)	
do	50	25	—	do	
				OILSEED (LINSEED)	
do	40 to 50	—	—	do	
				TEA	
do	80 to 120	50	—	To be applied at the end of February or the beginning of March.	

Region/District	Dose in pounds/acre N P_2O_5 K	Time and method of application	Remarks
	CITRUS AND APPLE		
All the districts	1/8 pound N per tree up to 8 years. After 8 years, 1 to 1.5 pounds N per tree.	Apply half the dose in February and the remaining half one month after flowering.	P and K may be applied when indicated by soil tests. Spray with 0.5 per cent zinc sulphate when symptoms of chlorosis appear.

Note :

1. Where N alone has been recommended, application of P and K may be made if indicated by soil tests.
2. In case of crops which usually receive basal dose of farmyard manure, additional application of 1.5 pounds N, 0.5 pound P_2O5 and 1 pound K_2O in inorganic fertilizers per cartload of farmyard manure is desirable.
3. In case of sandy soils, split doses of fertilizers and lighter irrigations are desirable.
4. The dose may be modified according to cultural and other agricultural practices followed and variety of crops sown.
5. In case of saline and akaline soils, reclamation should follow for getting a good stand of crops.
6. For any other information regarding fertilizer recommendations consult Agricultural Chemist, Ludhiana, or Agricultural Inspector of your area.

BETTER FARMING TIPS

TIMELY IRRIGATION MEANS GOOD CANE

TIMELY irrigation to sugarcane means a better crop as well as more sugar recovery. Hence, irrigation is an important operation in sugarcane cultivation.

The following is the irrigation schedule recommended by experts. From planting to the middle of April, the crop should be irrigated every 15 to 20 days, and afterwards up to the onset of the monsoon, every 10 days. During the monsoon, no irrigation is needed, but if there are long dry spells of more than three weeks, irrigation becomes necessary.

In October, irrigation is needed every fortnight and later, till January, every 3 to 4 weeks. In January and February, irrigation helps to save the crop from frost.

The common belief that irrigation in October-November delays the maturity of cane is not true. Experiments have proved that irrigation is helpful in increasing the sugar content in the cane rather than reducing it.

HYBRID COTTON

VERY soon hybrid cotton will be as popular with the farmers as hybrid maize is.

Preliminary experiments have given very good results. Seed which was obtained from a cross between an Indo-American cotton *B.C. 68* and the fine long-linted Sea Island variety *S.I.V. 135* was used for trial in farmers' fields in the Kaira and Mehsana Districts of Gujarat State. The yields obtained were 1,656 pounds and 1,382 pounds of seed cotton, respectively.

Hybrid cotton has a fibre length of 1.24 inches and a spinning capacity of about 80's to 100's and was found as good as Sudan *G. 25* cotton so far as length, fineness and strength were concerned. Quality is so high that traders offered Rs. 2,000 per candy (784 pounds).

Further efforts to improve the quality and also to produce hybrid seed on a large scale are now underway.

GROWING KAGZI LIME

(*Contd. from page 9*)

Shade the newly planted crop with paddy straw or redgram straw. Also, provide a fencing against cattle and goats. Every alternate day, make it a point to remove any black caterpillar with lemon-coloured neck which you see feeding on the leaves. If you see a leaf miner (another caterpillar) which lives inside the leaf spray with fish-oil-rosin-soap (one ounce in a gallon of water) or a *neem* cake decoction. If you see corky brown swellings on the stems, it means the plants are having canker disease. Spray 5:5:50 Bordeaux mixture at 30 gallons (seven kerosene tins) per acre every fortnight during the rains and every month for the rest of the year. Apply Bordeaux paste to the stem at ground level to prevent another disease (gummosis) which causes gum to ooze out from the plants.

Avoid deep digging in summer or exposing of the roots of the plant. Give the trees a rest for a fortnight in May-June and spray Bordeaux mixture once before rains set in.

HOW TO HARVEST

Kagzi lime bears thrice a year. The June-July crop gives better yields than the October-November and March-April ones. Pick the fruits when fully yellow. Store the fruits in a cool place on straw. Lime will keep well for a month if you wrap them in tissue paper.

Kagzi lime has a good demand in the market. An acre of crop easily fetch a thousand rupees a year.

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EDITOR

'EXTENSION'

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Krishi Bhavan

NEW DELHI

WHETHER you stitch your garments at home or get them stitched by the tailor, there is always a need for home sewing. And home sewing becomes easier if you practise these suggestions.

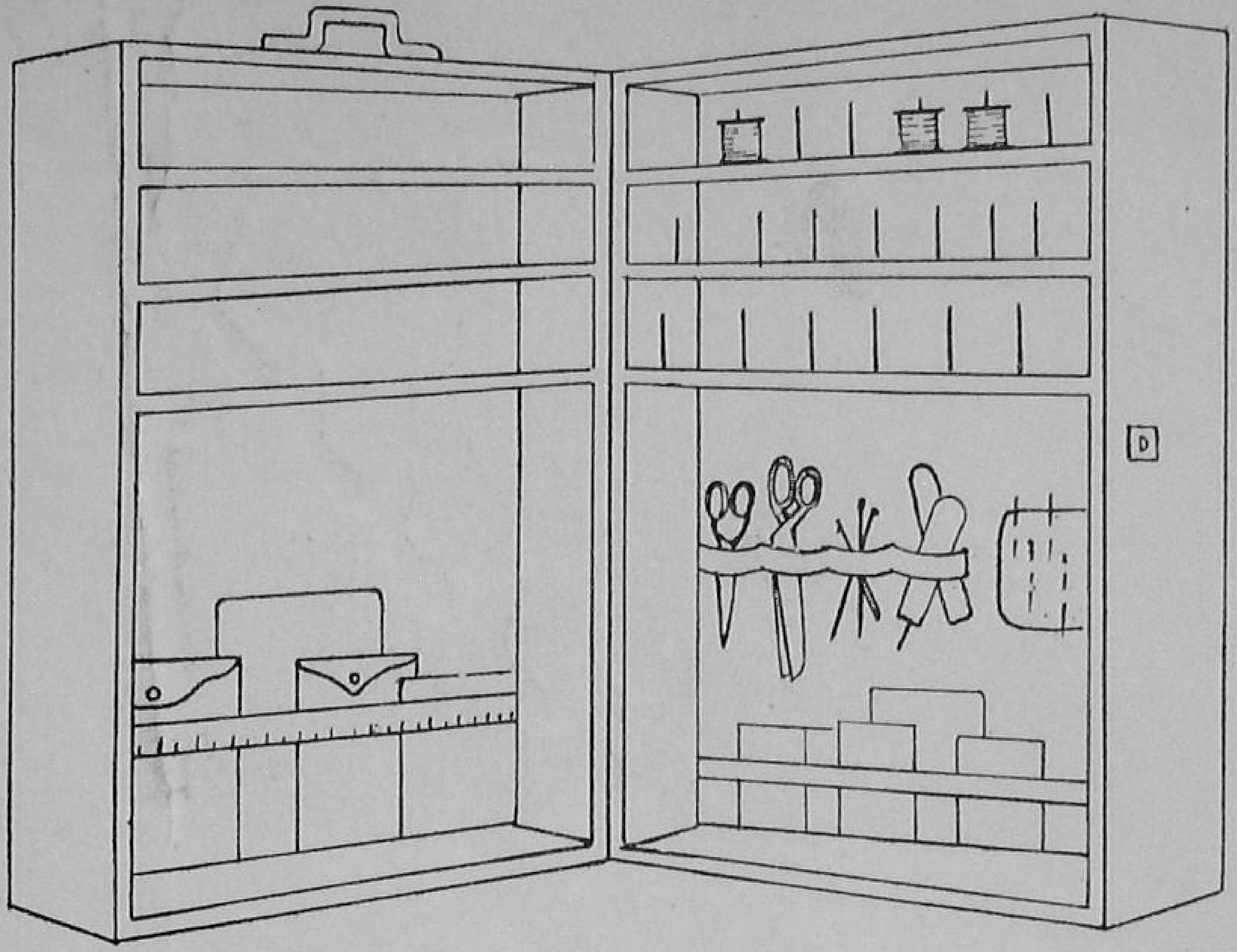
Think out each step of your work; you will then be sewing faster and easier. Collect all the materials that you will be needing. Draft the pattern to the exact size. This type of planning certainly will save time.

To produce good work, you need good tools. It will not be a help if you have to start looking for thread or needle once you start your work. Hence, have all the small things placed in their proper places in your sewing kit or cabinet, and put them back after use in the right places.

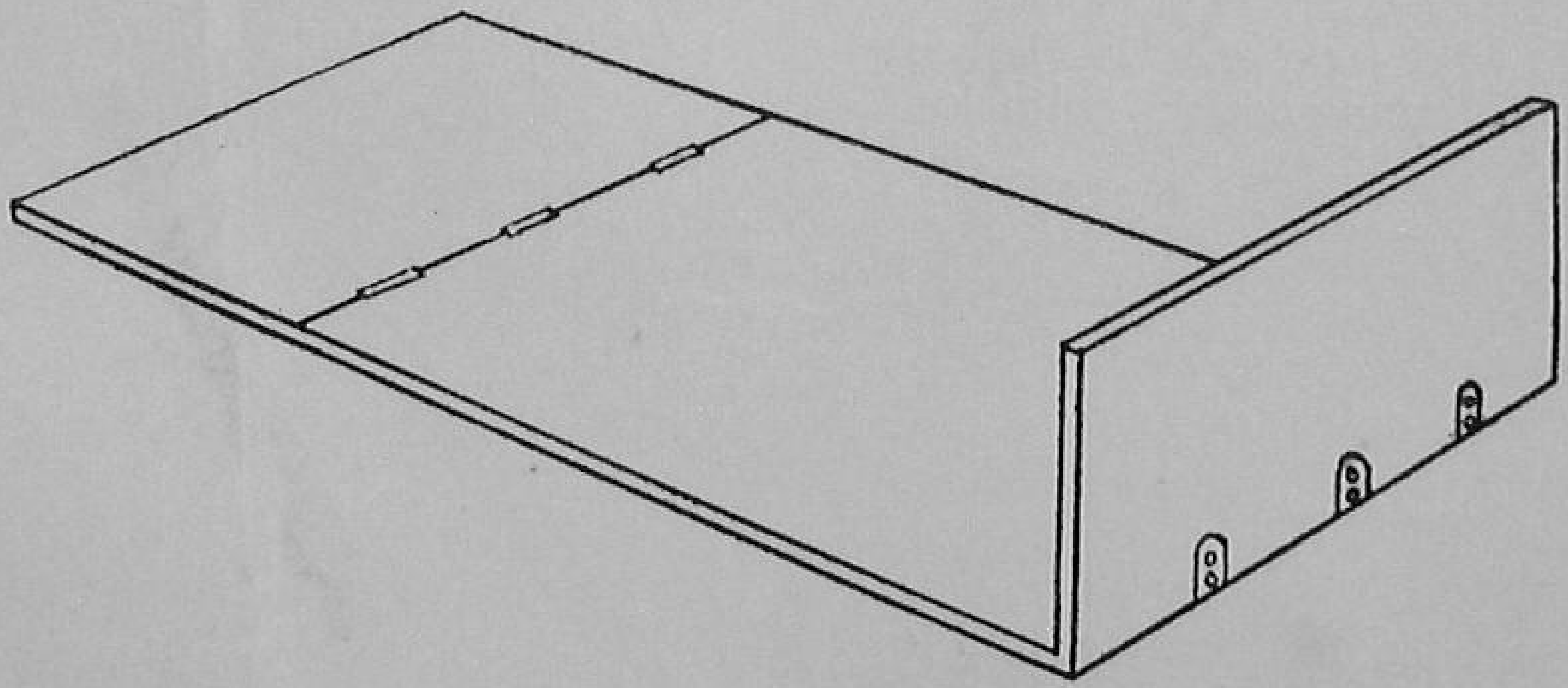
Sewing

IS EASIER THIS WAY

By KAMLESH PURI



A cabinet to hold all your sewing materials



This folded table will come in handy for cutting out the garments

Among the large equipment you will need, will be the sewing machine itself, a flat surface for cutting out the garments such as a table and an iron.

A spool-holder, whether in the sewing machine drawer or in the sewing kit will keep the coloured threads easily seen and convenient for use. A small cardboard or wooden board with small nails driven into it on the wrong side will also serve the same purpose.

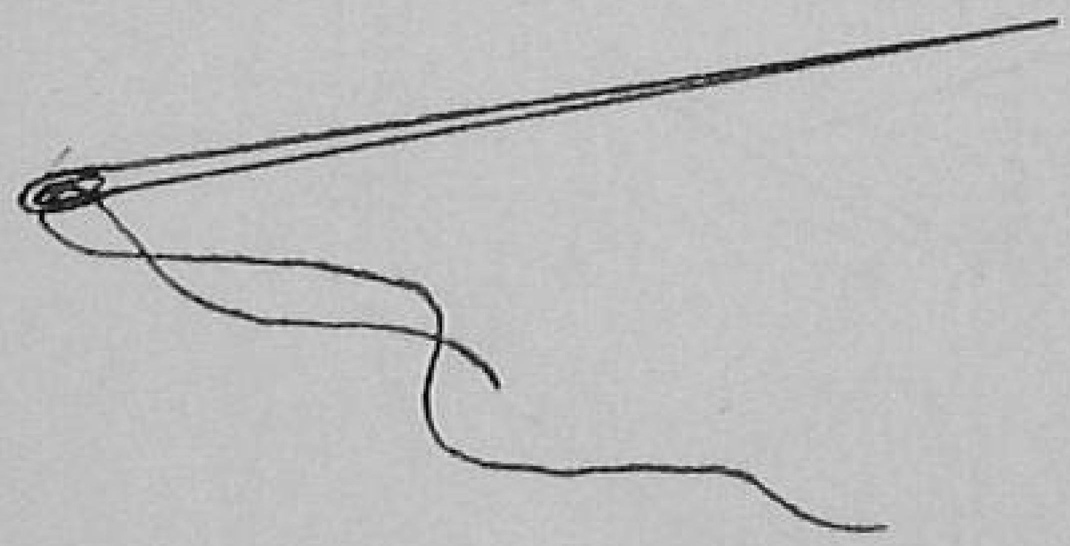
A small piece of magnet will prevent your sewing needles and pins going astray.

Using beeswax on the thread will prevent knotting, and will also make it stronger.

Instead of a cabinet, you can as well use a kit for placing all your things together

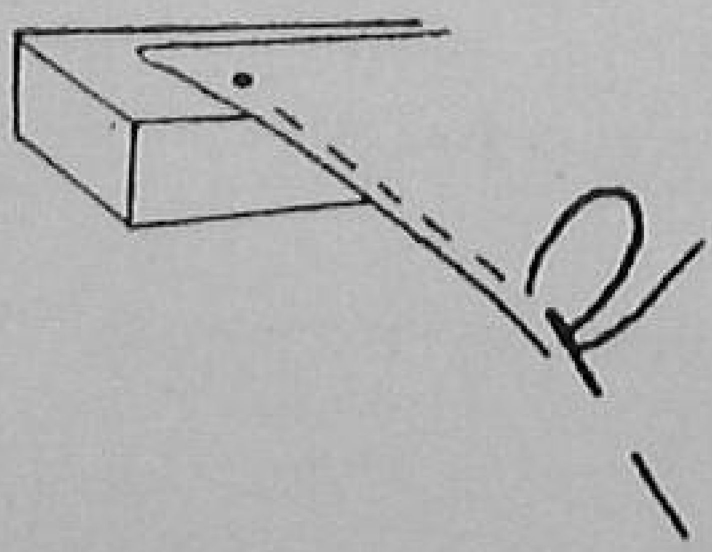
This is particularly helpful when sewing on buttons.

Use needles with long eyes. They are easier to thread. Darning needles with long



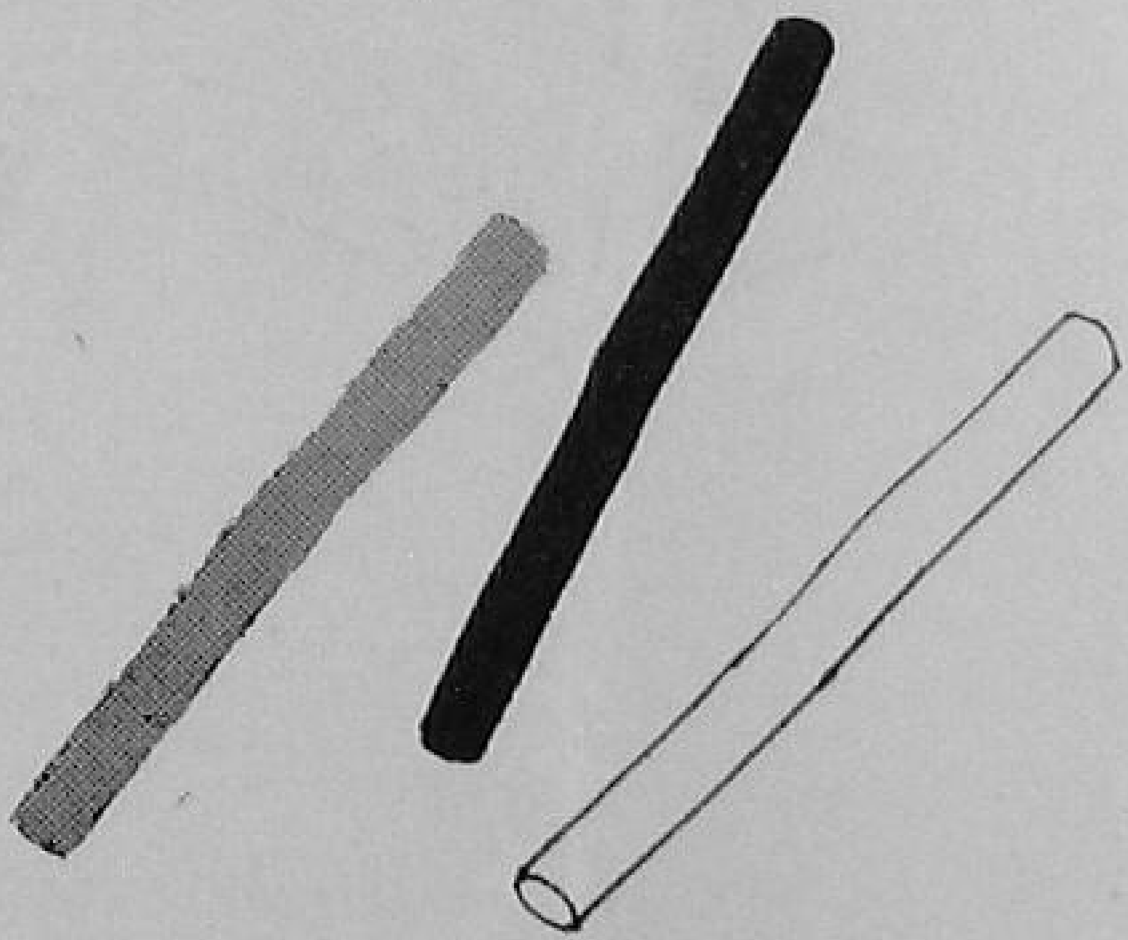
eyes are very suitable for basting and for putting in of the hems.

Make a padded brick for yourself. It



makes basting and ripping much easier.

Pad and cover an ordinary brick, and pin the material to it while working. The weight of the brick will hold the material and make the working easier for you.



Ordinary coloured chalks or a tailor's chalk—both light and dark coloured—make marking much easier.

Some fuller's earth or talcum powder will come in handy when you get a stain on your sewing material.

Keep a six-inch ruler and a one-sided razor blade for easy measuring and cutting of paper.

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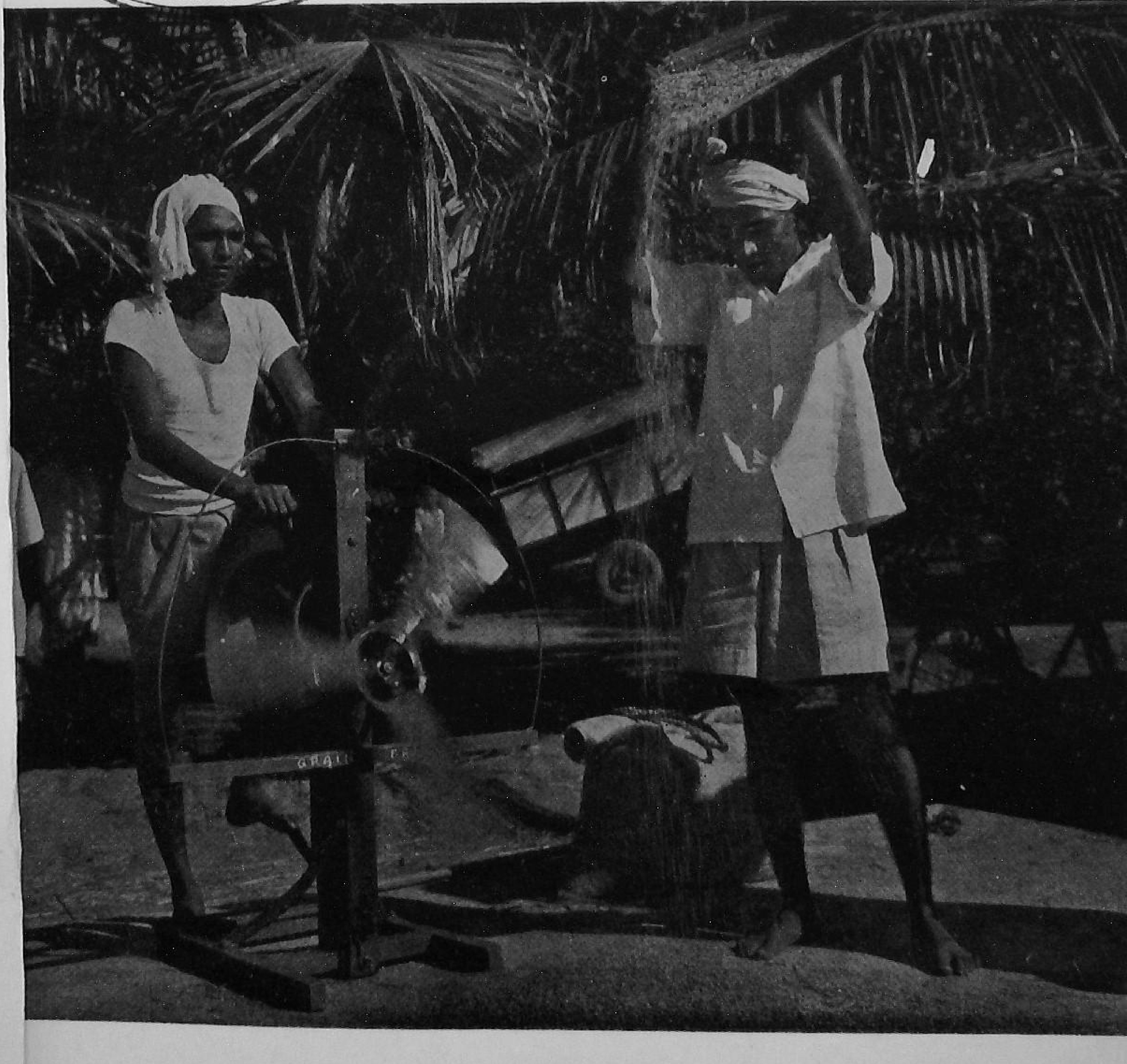

THE FARM AND FARM HOME MAGAZINE April, 1962

THE PICTURE ON THE COVER

Don't wait for the wind for winnowing. There are machines and fans to help you out. This portable fan, mostly used for paddy, is pedal operated. It costs just about Rs. 30, but does a very quick and clean job of winnowing.

EXTENSION

THE FARM AND FARM HOME MAGAZINE

Vol. II April, 1962 No. 10

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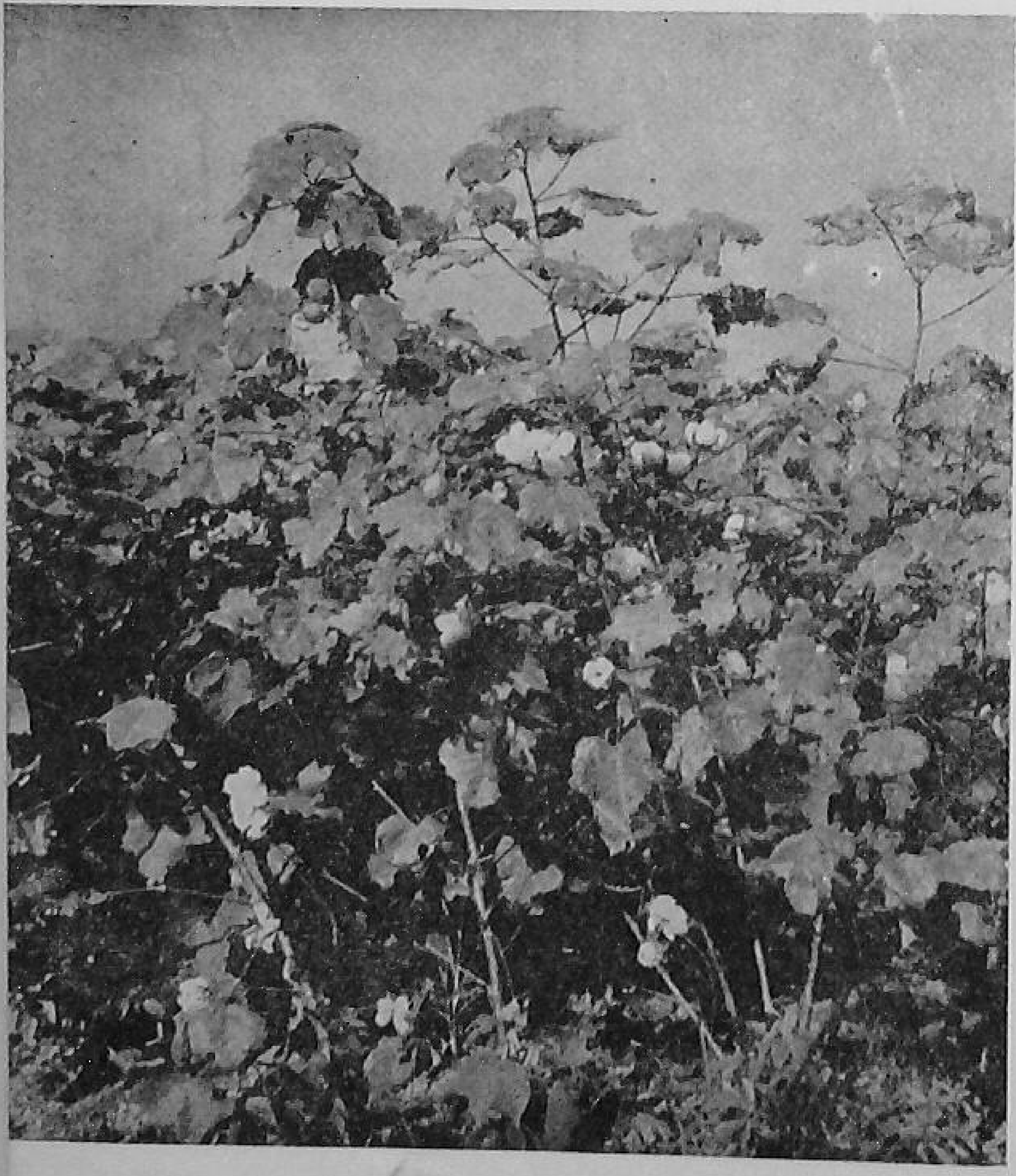
3 REMINDERS TO PUNJAB COTTON GROWERS

Cotton growers are sure to make more money only if they remember to do the right things at the right time



FARMERS growing American cotton in the Punjab should follow a proper manuring, spraying and irrigation schedule to get high yields from the crop they have sown.

1. Irrigate Copiously

About three to four weeks after sowing water the field copiously. Thereafter, water the field every fortnight till the rains set in.

During the rainy season irrigate only when there is a break. Again, irrigate once when the crop is in flower. Such an irrigation results in a higher cotton yield.

After the first irrigation, thin out the crop when the field is ready for it. Leave a distance of one foot between the plants and 2½ feet between the rows. This way there will be about 17,424 plants in all in an acre.

2. Fertilize Liberally

It is recommended that the cotton should receive 2 to

2½ maunds of ammonium sulphate or calcium ammonium nitrate per acre in addition to the farmyard manure you supply.

Give this ammount in two doses—the first after the thinning and the second when the crop is in flower and the bolls start forming. Place the fertilizer three inches away from the base of the plant.

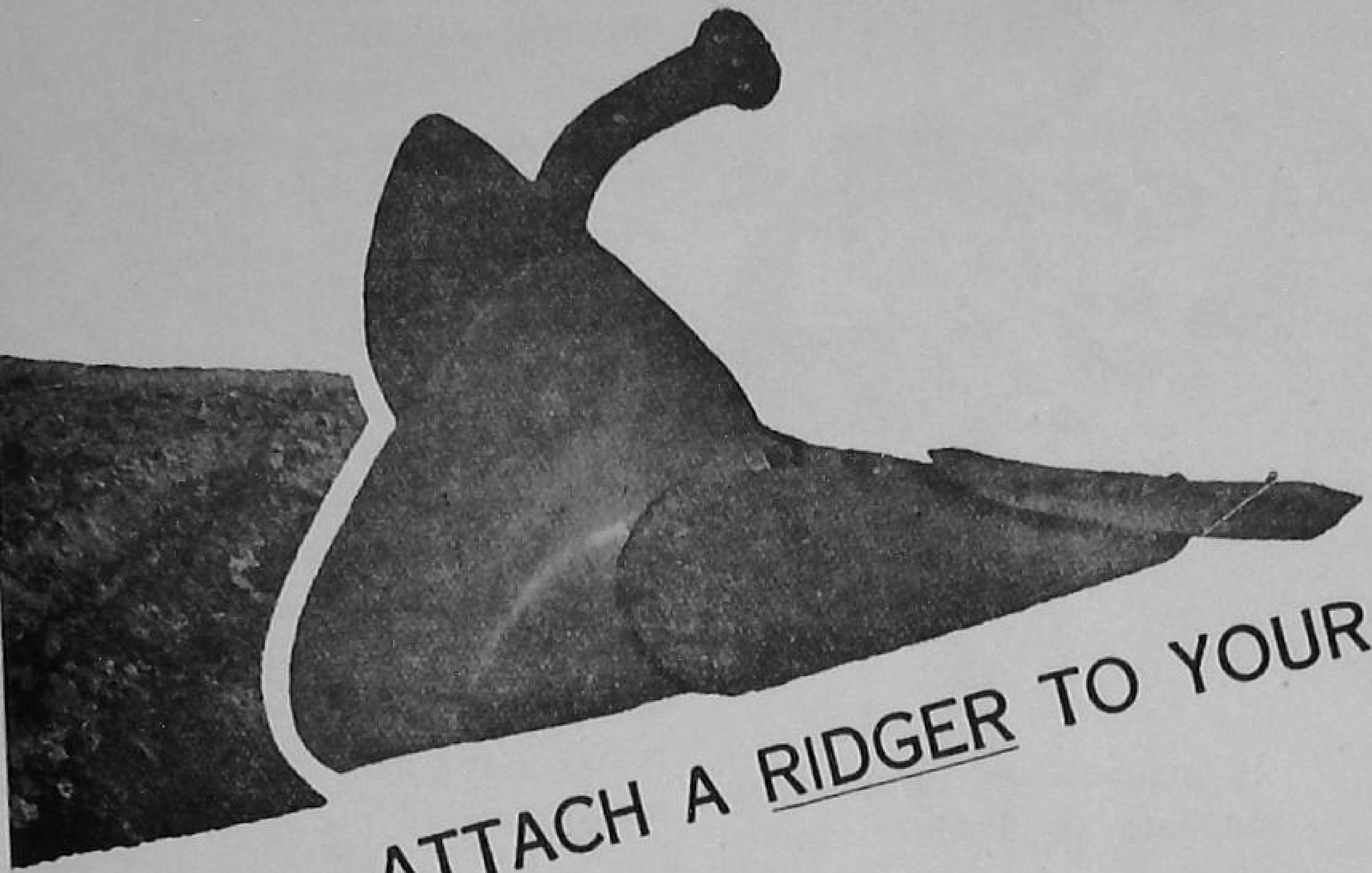
3. And Spray in Time

June, July and August are the months when cotton is attacked by several pests. Whether there is any attack or not, better spray the crop thrice—first in June, next in mid-July and the third one in August so as to avoid only pest trouble.

For each spray use two pounds of BHC 50 per cent and two pounds of DDT 50 per cent wettable powder or 1 pound of Endrin. Mix these in 80 to 100 gallons of water, and spray.

Such a spraying schedule will keep down three vicious pests of cotton—white flies, jassids and leaf rollers at one time. At the same time the boll-worm attack will be reduced to half by such sprayings.

In all you might have to spend about 30 rupees for spraying, but the returns will be many times more.

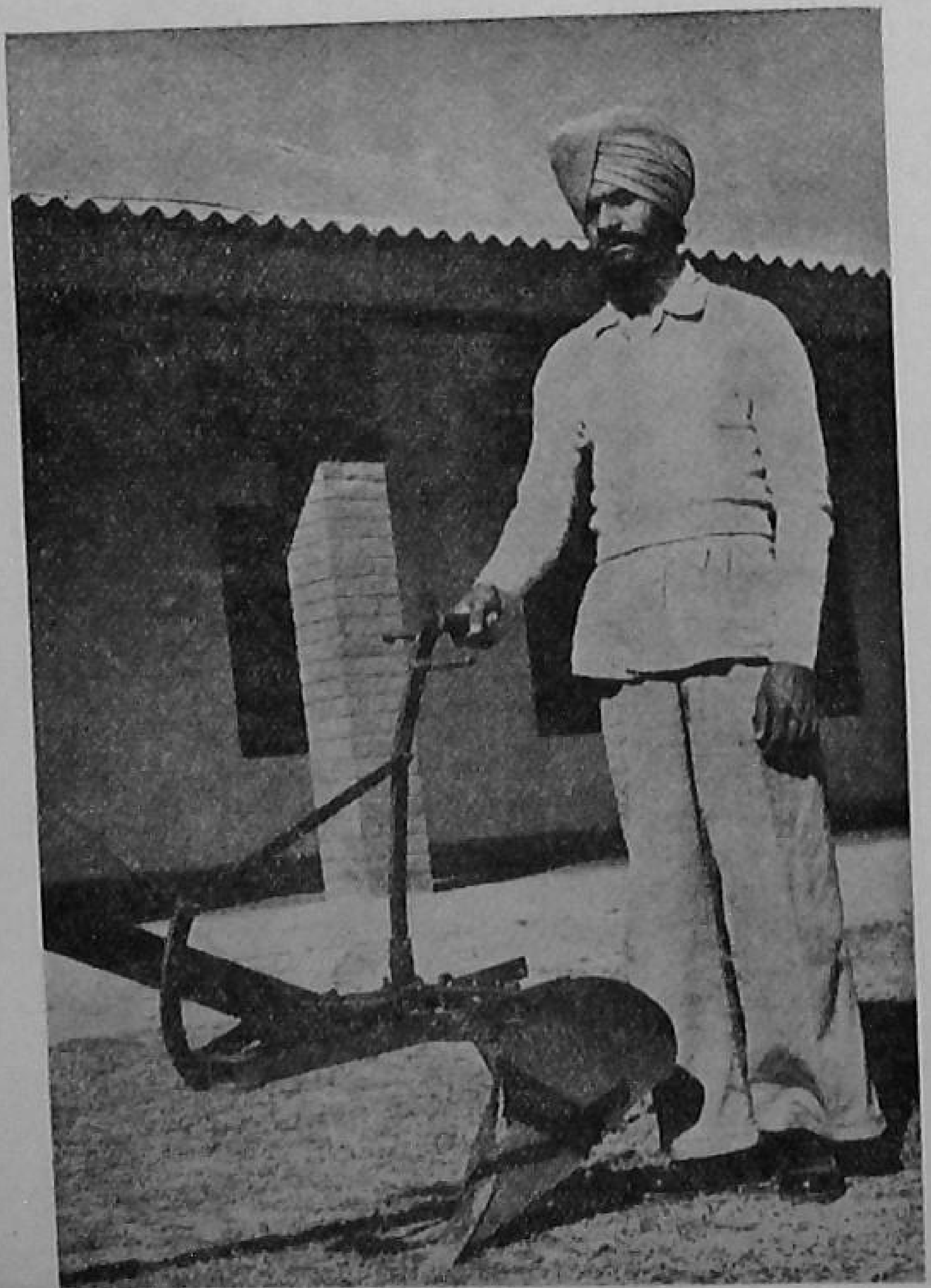


ATTACH A RIDGER TO YOUR CULTIVATOR

By D.N. KHERDEKAR

WHEN you grow vegetables or irrigated field crops such as sugarcane or potatoes, or have an orchard, you have to make ridges and furrows. Some farmers use a ridger plough for this purpose after the land is ploughed, harrowed and levelled. They use the ridger plough again for earthing up the crops. They cannot, however, use it for the normal ploughing.

Making furrows can be easily done with a ridger attached to a multi-purpose implement such as a three-tined cultivator (like the *triphali*, *tifan* or Akola hoe). Like the ridger attachment, you can attach a standard mould-board plough, or seeding attachment to such a cultivator.



With a light ridger attached to the cultivator, you can make furrows 6 to 8 inches deep and 8 inches to a foot wide. However, before making the furrows, see that the soil has been properly pulverized. A ridger attachment will not work on unploughed land or on a hard soil.

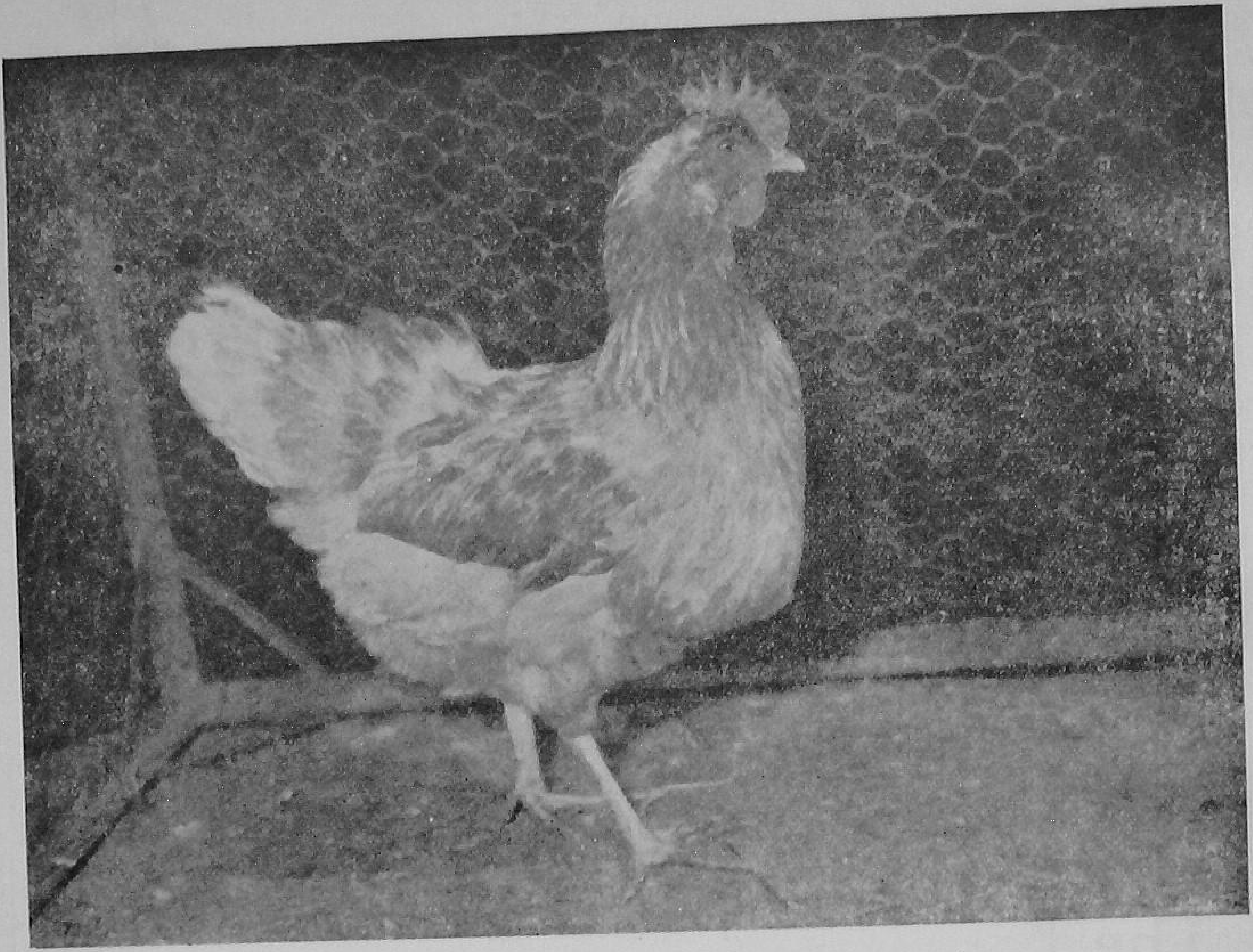
A cultivator with a ridger attached can be easily worked by a pair of bullocks. By changing the angle of the beam, you can increase or decrease the depth of the furrow. A cultivator can be had for 40 to 45 rupees and a ridger attachment will cost you rupees 25 more. The implement is simple and can be easily repaired in your village.

The POULTRY BREEDS that pay

By S.G. IYER

OUR poultry-keepers know that it is not paying to keep *desi* birds. Hence, they commonly ask this question : What breed should we keep ?

The breed you should keep depends upon the purpose for which you are keeping poultry. Most people in our country keep poultry for producing eggs. The egg market to which you sell your poultry produce also influences the type of breed you have to keep. It is no use keeping a breed that produces brown coloured eggs when the market demand is for white eggs.



A Rhode Island Red hen is a good layer and a producer of good quality meat

In India, there are a few breeds that can give you a high egg production. Among these, White Leghorn and Rhode Island Red are the most popular breeds.

A pure-bred hen, laying 150 eggs a year, produces eggs about three times her own weight. A hen must, therefore, be vigorous, as shown by bright full eyes, a bright red comb and wattles, and a strong body with well-placed legs. Breed alone does not count. The strain of the breed is also important, because within a breed only a few strains lay well.

Many commercial producers prefer White Leghorns to other breeds. The breed is well-suited to hot, dry areas. The birds seldom go broody. They are very good for intensive management. The eggs they lay are white-shelled and large in size. But White Leghorns do not produce as good meat as Rhode Island Reds do.

In keeping White Leghorns, you should be aware of one thing: if they are hatched too early, that is, in September and October, they tend to go on moult after laying for three or four months, when they are about ten months old. This you can overcome by carefully selecting the breeding birds. Leghorn pullets start laying at about 5½ months of age. They generally start laying

mouth Rock for commercial egg production. A first cross between two good laying strains of different breeds such as Australorp and White Leghorn or Rhode Island Red and White Leghorn is good for commercial egg production and you can get about 20 per cent more eggs from the cross-bred birds. The male birds of the cross-bred stock make good table poultry.

If you prefer to produce table birds for sale, you should go in for the broiler strain of the White Rock breed.

Apart from their breeding background, look for the following characteristics in the birds while selecting them for your poultry farm.

WHITE LEGHORN

The comb is single. The face is bright red. The wattles are red, large and fine in texture. The eyes are bright red and prominent. The standard weight of the breed is : cockerel five pounds, pullet four pounds. The colour of the feathers is solid white. The tail feathers are usually carried at an angle of 45°. The body should be deep with broad back. The abdomen of a good layer should show at least four-finger space between the breast bone and the pubic bones.

RHODE ISLAND RED

The comb and wattles are red, and not so well-developed as in White Leghorn. The face is bright red. The eyes are also red and bright.

The standard weights are : cockerel six pounds, pullet five pounds. The feathers are mostly rich red on the body. Neck, wing and tail feathers show black markings, and occasionally, one or two white feathers may be seen. The tail is usually carried at an angle of 30°. The body of a good laying bird is deep, with a long and broad back and the abdomen should show five to six fingers space between the breast bone and the pubic bones.

You can get White Leghorns and Rhode Island Reds from Government Poultry Farms. You can also obtain cross-bred birds from these farms if you can book your order early. These will be more suitable for backyard poultry keeping.

Whatever the breed you keep, you will have to feed the birds well to make them really pay.

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CUTTING SHORT THE DRY PERIOD OF COWS

By HARBANS SINGH

MANY villagers do not have their cows served for many months after calving. As a result, village cows calve at intervals of 18 to 20 months. Of this period, 9 to 11 months are generally dry. Some villagers also believe that if the cows are served early, it will only lead to a short milking period and a low milk yield.

This, however, is a wrong impression. The shorter the interval between two calvings the better the animal as a milk producer.

Uniform calving will mean an even milk supply all the year round.

Serve the cow as early as possible after calving. If you have taken good care of the animal, she should be able to conceive within 100 days of calving. If you serve the cow within this period, not only milk production increases but the calf born also is heavier in weight.

To serve the cow in time, you should watch her for heat signs. A cow comes into heat every 19 to 21 days. Each time the heat lasts for 12 to 24 hours. The best time to serve the cow is from the middle of the heat period to the end of heat. A she-buffalo comes into heat every 21 to 23 days. The heat lasts for 18 to 36 hours. As in the case of the cow, the best time of service is mid-heat to the end of heat.

Look for the following signs of heat in the cow or the buffalo:

Restlessness in the animal.

Reduced milk yield.

Flow of a colourless transparent mucus from the genital organs which many times is seen on the tail and flanks. Sometimes, the external genital opening is swollen and red.

Bellowing and keeping the tail raised.

Frequently mounting other cows.

Sometimes, milk seen in the teats after the animal is completely milked.

If the animal does not come into heat in time, show it to a veterinary doctor.

Cows take 280 days for calving from the date of service and she-buffaloes 310 days. Generally, cows calve from January to April and buffaloes from August to November.

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GREEN MANURING

at almost no cost

SOME West Godavari farmers are green manuring their lands in a novel way, almost at no cost. They are raising in their rice fallows a crop of *Indigofera* (indigo) as green manure together with a cash crop of of groundnut. The usual practice, however, was to raise with irrigation a crop of groundnut alone.

This new method, they feel, is useful to them in many ways. For they are not to spare any land exclusively for a green manure crop, which is hard to do for many a farmer with small holdings. They can get a good groundnut crop over and above a green manure crop. Moreover, it makes their land richer for the next crop and they get a stock of green manure seed for their land for future use. It has enabled the farmers to harvest a bumper crop of paddy that followed the indigo—groundnut mixture. This is the way how they do it.

Light soil of the sandy loam type is ploughed three or four times with a country plough after the previous paddy crop is harvested. Five to ten cartloads of farmyard manure or compost together with 200 pounds of superphosphate is applied to an acre while preparing it. The field is then made into small plots of convenient size for irrigation and kept ready for sowing.

Groundnut seed is sown behind a country plough. About 160 to 180 pounds of *T. M. V-2* (Bunchy type) pods are sufficient to provide seed for sowing an acre.

After the groundnut seed is sown, eight to ten pounds of indigo seed is broadcast on the same land. The levelling plank is then drawn to cover the seed with earth.

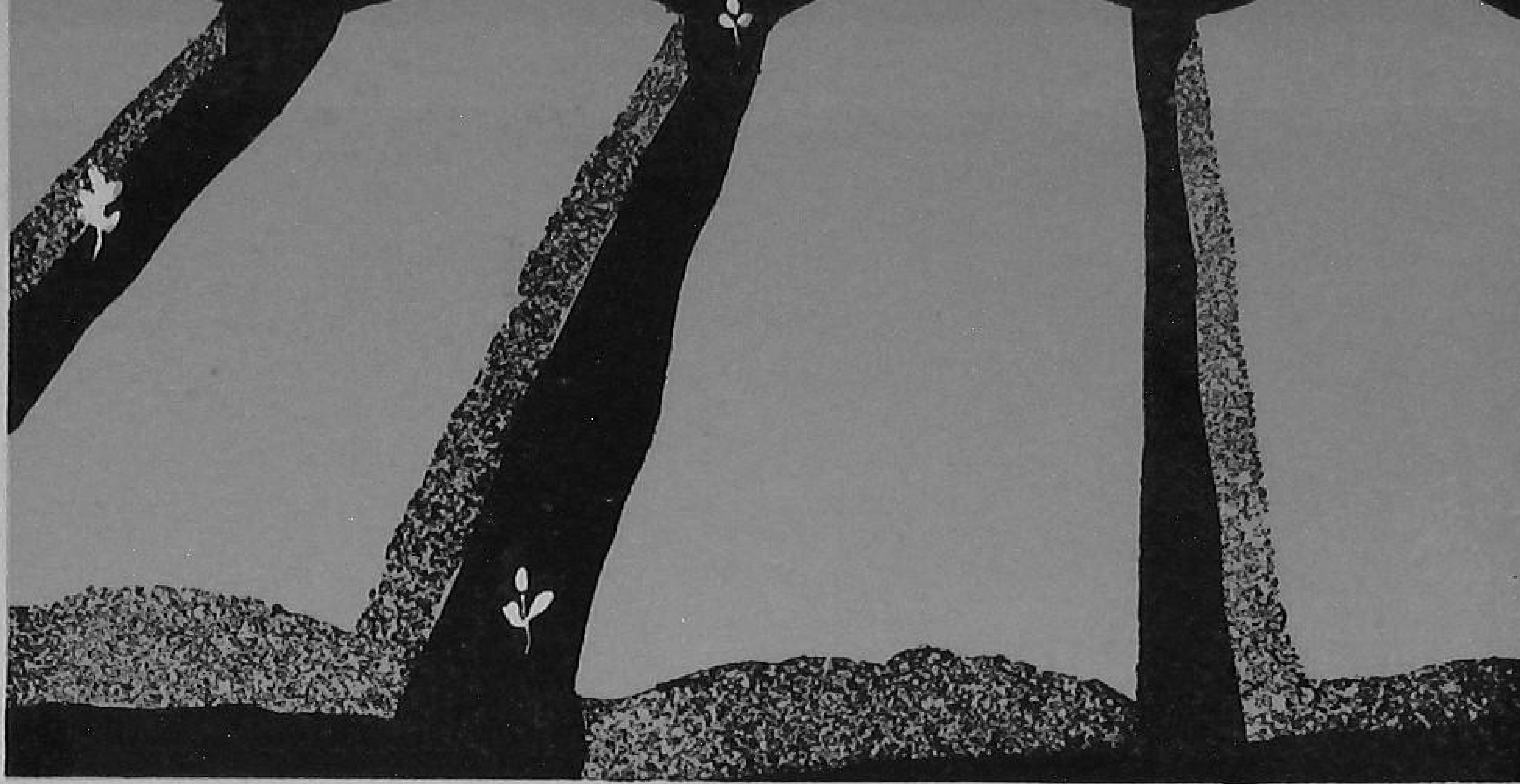
First irrigation is given 20 to 25 days after sowing the groundnut. This helps the indigo to pick up growth. The second irrigation is given about a month after the first, when the indigo plants are about four inches high.

If the crop in the field does not appear to be sufficiently vigorous, it is topdressed at five pounds of nitrogen per acre during the second irrigation.

If sown by the third week of December, groundnut becomes ready for harvest by the first week of April. The indigo plants are one to one and a half feet high by then. Subsequently by May if there are no rains and the soil is too dry, the indigo crop is given another irrigation.

A crop of groundnut yields about 1,500 to 2,000 pounds of pods per acre.

The indigo plants yield enough seed to make the farmer self-sufficient for his future needs, before it is pulled out and puddled in the field. About 5 to 6 thousand pounds of green matter is obtained from an acre of an indigo crop. The land is then prepared for the next paddy crop. The farmers of West Godavari who have been following this practice are harvesting, on an average, 50 maunds of paddy to an acre.



PREPARE COMPOST THE RIGHT WAY

By A. RAMASAMY

COMPOST making is not just piling up rubbish in a pit. There is a right way of preparing it.

While many farmers are aware of the value of compost as a manure and some of them have also taken to preparing their own requirement, they do not know how to make it in the proper way. As a result it becomes less valuable as a manure.

Compost manure contains most of the food elements your plants need. When you apply it to the soil, you not only supply the plant food but also improve its health, structure as well as its water-holding capacity.

To get the full benefit out of your compost, prepare it in a right manner.

Select a place at a higher level to avoid water stagnation during the rainy season.

Dig a pit 15 feet long, 8 feet broad and 3 feet deep. You will be able to get at least 14 cartloads of compost from a pit of this size.

Next, construct a 1½-foot high wall around the pit to prevent the rain water entering into it from the surrounding areas. As, too much of moisture spoils the manure and reduces its nitrogen content. Now, start filling the pit with the material like sweepings, dry leaves, green leaves and farm wastes. It is better to divide the pit into three portions and fill it part by part. It will take anything from 1 to 1½ months for filling the pit completely.

Do not leave the material you put in the pit uncovered. After filling it, cover the top portion of the pit with silt and cow-dung in the shape of a dome.

Do not disturb the pit for three weeks except for giving three waterings during this period. Apply water just to soak the compost material. Too much of watering is bad for your compost. It will be better if you mix well-rotted cow-dung with the water before sprinkling it over the heap. After four to six weeks' time, the compost will be ready for use.

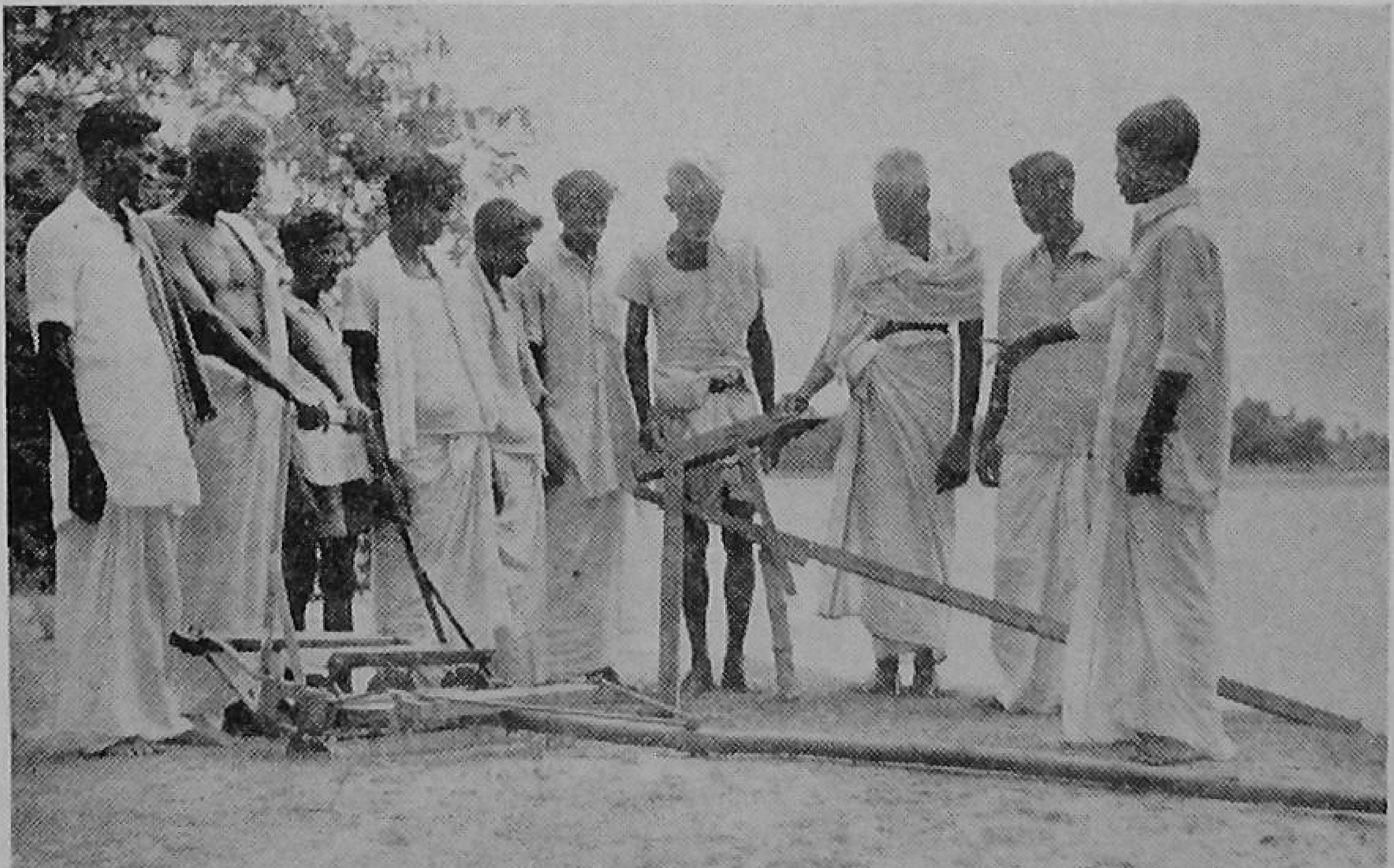
Compost prepared this way will have more nitrogen and will serve your crop better.

The Package Programme in Tanjore

INDIA'S recent approach towards a rapid rise in food and farm production is the inauguration of the Intensive Agricultural District Programme (The Package Programme as it is popularly called) initially in seven selected districts. Tanjore District in Madras State opened its doors to the Programme in April, 1960, and provides an example of the vigour with which this Programme is being implemented.

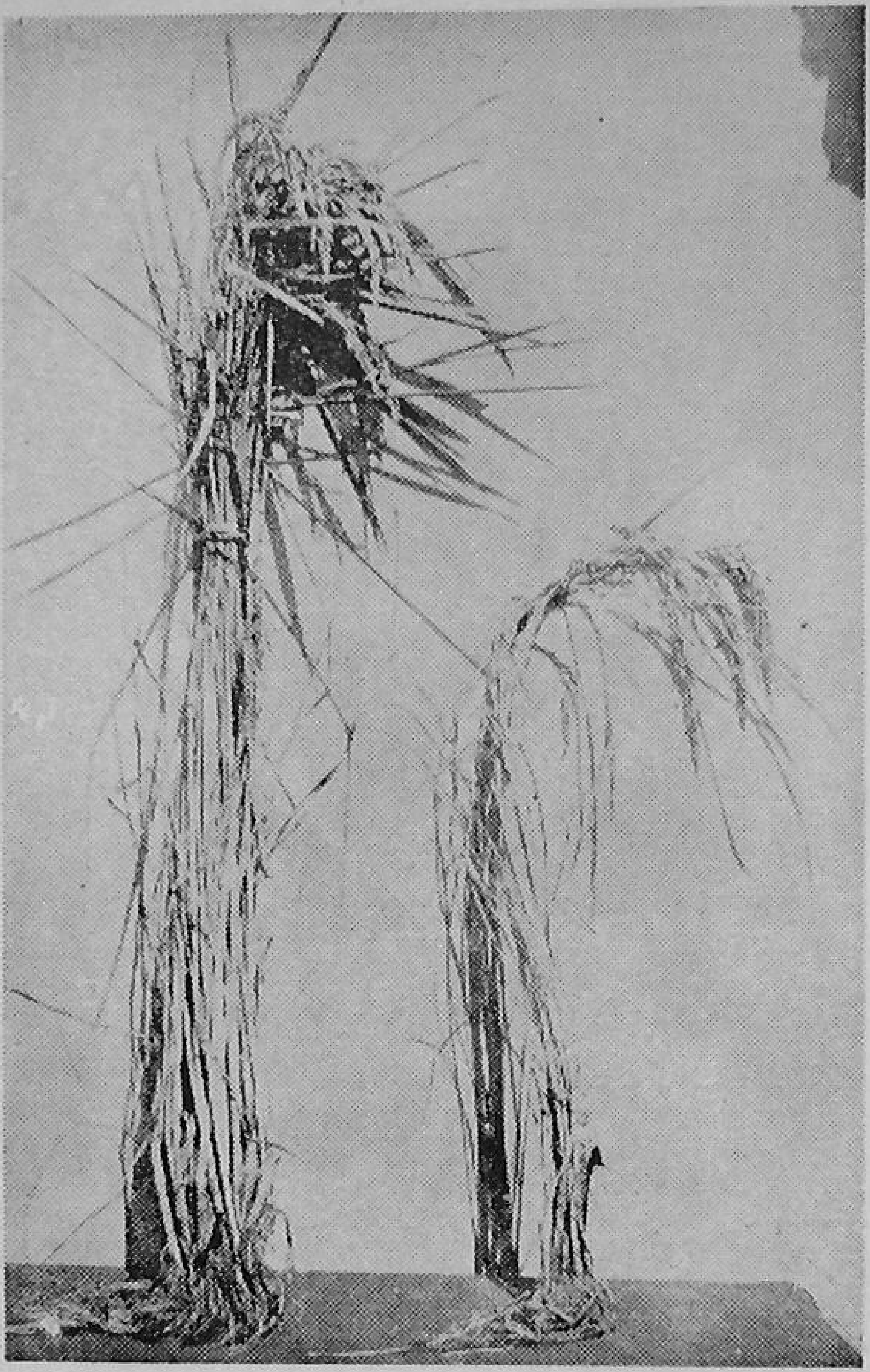
The District has set its goal of raising the per-acre yield of rice, the principal food crop of the District, to 1,650 pounds from the present 1,320.

Popularisation of improved agricultural implements which save both labour and time is one of the highlights of the Programme Here a Gram Sevak is seen explaining the salient features of an improved plough and the wet-land puddler to a group of farmers in Tiruchinapundi village



Tanjore farmers are reaping richer paddy harvests thanks to the Intensive Agricultural District Programme

Timely plant protection measures save crop losses from pests and diseases. Under the Programme, sufficient pesticides and plant protection appliances are made available to the farmers of Tanjore. Here a cultivator is seen dusting his paddy crop against rice hispa



Two clumps of paddy. The one on the left with heavy tillering and grain formation is from a field in Tanjore cultivated by the Japanese method. The poor one on the right is from an adjacent field cultivated by the local method

In a year, as per a set plan, 3½ lakh acres of Tanjore's 15 lakh acres under paddy have been put under improved practices. To aid farmers reap better harvest, 1,200 tons of improved seed, 4,500 tons of fertilizers and 6,000 improved implements were made available to the farmers. Over 53,000 farmers were helped in preparing individual farm production plans. To make the job of taking up improved practices easy, over 1,800 demonstrations were carried out in the District and short-term credit worth 54 lakhs of rupees was made available to them. Sufficient care is being taken to protect the crops from pests and diseases, and during last year nearly 400 tons of chemicals were utilized for the purpose.

The Rajasthan Farmers'

FERTILIZER

GUIDE

Districts or areas for which recommended	*Dose of nutrients in lb. per acre*			*Time and method of application*	*Remarks*
	Nitrogen	*Phosphoric Acid*	*Potash*		
			Wheat (Unirrigated)		
Kota, Bundi and Jhalawar and other tracts.	15	20	—	Nitrogenous fertilizer to be broadcast and phosphatic fertilizer to be drilled 2" below the seed before sowing.	Application of K_2O may be made if indicated by soil test.
			Wheat (Irrigated)		
All wheat-growing areas.	40	40	—	Nitrogenous fertilizer to be broadcast just before sowing or with first irrigation and phosphatic fertilizer to be drilled 2" below the seed before sowing.	do.

Districts or areas for which recommended	Dose of nutrients in lb. per acre			Time and method of application	Remarks
	Nitrogen	Phosphoric Acid	Potash		
				Barley	
Jaipur, Alwar and Bharatpur, Bundy, Ganganagar and other areas.	30	30	—	Nitrogenous fertilizer to be broadcast just before sowing or with first irrigation and phosphatic fertilizer to be drilled 2" below the seed before sowing.	Application of K_2O may be made if indicated by soil test.
				Maize (Local)	
Udaipur, Bhilwara, Ajmer Chittorgarh, Banswara and Dungarpur and other areas.	40	40	—	do.	do.
				Bajra	
Ajmer Division, Jodhpur, Pali, Nagore and Jalore and other tracts.	15	—	—	Nitrogenous fertilizer to be broadcast just before sowing.	Application of P_2O_5 and K_2O may be made if indicated by soil test.
				Paddy	
Kota, Bundi, Udaipur divisions and Sawai Madhopur and other tracts.	40	20	—	Nitrogenous fertilizer should be applied in two doses. Broadcast half of it at the time of sowing or transplanting and the remaining half as top-dressing at tillering time.	Application of K_2O may be made if indicated by soil tests.
				Cotton (Unirrigated)	
Kota, Tonk, Udaipur Division and other areas.	30	30	—	Nitrogenous fertilizer to be broadcast and phosphatic fertilizer to be drilled at 2" below the seed at the time of sowing.	Application of K_2O may be made if indicated by soil test.

Districts or areas for which recommended	Dose of nutrients in lb. per acre: Nitrogen	Phosphoric Acid	Potash	Time and method of application	Remarks
				Cotton (Irrigated)	
Shri Ganganagar and other areas.	60	60	—	Half of the nitrogenous fertilizer to be broadcast just before sowing and the remaining as top-dressing just before flowering. Phosphatic fertilizer to be drilled at 2" below the seed at the sowing time.	Application of K_2O may be made if indicated by soil test.
				Sugarcane	
do.	150	100	—	Half of the nitrogenous fertilizer to be broadcast just before planting and the remaining half to be applied at earthing up time. Phosphatic fertilizer is to be drilled 2" below the seed just before planting.	do.
				Jowar (Grain)	
Kota Division, Sawai Madhopur, Tonk District and other areas.	30	20	—	Nitrogenous fertilizer to be broadcast and phosphatic fertilizer to be drilled 2" below the seed just before sowing.	do.
				Vegetables	
For all Districts	75	75	30	Nitrogenous fertilizer should be applied in two equal doses by broadcasting just before sowing and as top-dressing after about a month. Phosphatic fertilizer is to be drilled 2" below the seed and muriate of potash to be broadcast at the time of sowing.	do.
				Citrus	
do.				do.	do.

4-STEPS
TO BETTER BAJRA YIELD

PRIZE-winning *bajra*-growers in Gujarat and Maharashtra States have shown that high yields of *bajra* can be obtained anywhere in the *bajra*-growing areas of our country. These farmers have raised five to six times as much as other farmers usually harvest.

To get better *bajra* yield, four things are important: improved seed, timely sowing, proper spacing and an adequate manuring.

Such a bumper *bajra* crop can be yours too if you follow the right method of growing it

There are several improved varieties of *bajra* suitable for different soil and climatic conditions. Select the one that suits your farm best. Here are a few improved varieties from which one can choose.

For Gujarat and Maharashtra
AF. 3, *B-207*, *32-C* and *14.D.*

For Punjab
T.55, *A.13*, *5-250* and *S. 53.*

For Rajasthan
T.5

For Uttar Pradesh
Local selections

For Andhra Pradesh
AKP. 2

For Madras
No.s 1,2,3,4 and *5*, *KI*, *XI* and *X2*.

For Mysore
Local selections and *Transval sajje*.

For Delhi
T.55

Sow *bajra* in time to get the best yields. *Bajra* does not like water-stagnation. If the sowing is followed by heavy rains, the seedlings die off in large numbers. The crop also suffers badly if there are rains during the flowering stage. Hence, you must adjust the sowing time accordingly.

The best time for sowing *bajra* in the Punjab is first to third week of July. In the South, however, it is best sown during February or March.

Always sow *bajra* very thinly. Experiments in the Punjab have shown that the best spacing for *bajra* is one foot by one foot. Some farmers mark lines 18 inches apart both ways and dibble 5 to 6 seeds at the crossings of these lines.

Since *bajra* seed is very small, do not sow it very deep.

Bajra crop needs only nitrogen. The crop, especially the hybrid one, responds very well to nitrogen. You can apply 40 pounds of nitrogen even under *barani* conditions with profit. But in low rainfall areas apply only 20 pounds of it.

Better apply the amount in split doses. *Bajra* has to be thinned out considerably. Hence, if you apply all the fertilizer in one dose, a part of it will be wasted. The crop can benefit if you apply the fertilizer once before the sowing and again before the ears start forming.

Follow the four steps and you are sure to get much more than what you have been getting so far.

We welcome your

QUESTIONS and SUGGESTIONS

Address them to

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'EXTENSION'

Directorate of Extension
Ministry of Food and Agriculture
Krishi Bhavan

NEW DELHI

BETTER FARMING TIPS

DOUBLE YOUR GINGER YIELD

THERE are two ways by which you can increase your per-acre yield of ginger. One is to plant the crop early and the other to mulch the crop with green leaf.

Experiments in Wyanad (Kerala State) showed that the crop planted in mid-April gave better yields than those planted in the beginning of May, mid-May and early June. Normally, on the West Coast, farmers plant ginger a few days before the onset of the south-west monsoon.

Experiments also show that mulching the crop with green leaf at 20,000 pounds per acre applied in three instalments can more than double the yield.

The mulch also benefits the succeeding crops.

ROGUING PAYS

MANY farmers grumble when they are asked to pull out undesirable plants from their fields.

They think it is inconvenient to do so. They also feel that there will be some loss in yield if they do so.

But they do not know that this small inconvenience and small loss in yield this year will pay well in the coming year.

If an improved variety they are growing should yield well, the first condition is that they keep it pure. If the seeds get mixed up, the crop does not ripen uniformly. The yield and quality of the produce also go down. Hence they obtain a lower price for the produce.

Farmers should, therefore, take care to see to it that they don't grow inferior varieties or diseased plants along with the improved variety. For this, they should 'rogue' the crop or remove the undesirable plants from the field before harvest. Only then they can keep the crop healthy and pure.

Farmers are advised to rogue out all diseased plants and burn them and also remove admixtures of any kind.

While harvesting a crop, they should also make sure that they don't mix up different varieties. They should thresh each variety separately and store the seed after drying in clean and disinfected containers.

STEM-BREAKING IN ARECANUT

IF you are an arecanut farmer, stem-breaking of the palms during summer surely is one of your problems.

During the summer months, palms exposed to the hot sun develop dark patches, especially on the south-western side. The stems get cracked, and wood-rotting fungi enter. On a windy day, especially during the monsoon, such stems break.

Experience shows that doing two things helps to get over this problem. First, grow leafy trees on the south-western side of your plantation. Second, protect the stems of unaffected palms with areca leaf sheaths.

If you have a few of the trees damaged already, you can tie split pieces of areca stems around the stems of such trees. This will protect them against heavy winds.

COTTON DISEASES CAN BE CHECKED

MANY of farmers are now following some simple precautions for checking the diseases of the cotton crop.

They are now careful not to stock the cotton stalks after harvest if there had been an attack from one or more diseases on the crop. They pull out the stems immediately after harvest and burn them. Along with the stems, they also destroy all shed leaves, flowers and bolls.

Research has found new varieties that resist attack from wilt, a common disease of cotton in many areas. But for other diseases like blackarm and root rot, no disease-resistant varieties are yet available, and hence the farmers will have to take other measures to check these diseases.

Intercultivating a legume like *moth*, which covers the soil and prevents the soil

temperature from rising, is one good way of checking the root rot disease. Patches in which the disease has appeared should also be isolated, and in these cotton should be rotated with some other crop.

For blackarm and anthracnose diseases, treating the seed with a chemical before sowing has given good results.

In all cases where a disease has appeared, it pays farmers to show the disease-affected plants to the Agricultural Officer of the area so that he may identify the disease and suggest how it can be controlled.

RENEW COTTON SEED

FARMERS growing improved varieties of cotton in Madras State are currently being advised that they should renew the seed once every three or four years.

This is because the practice of keeping the seed of one harvest for the next sowing continuously for years, as is being followed by farmers, has disadvantages.

If the initial seed of the improved variety the farmer obtained, contained any 'off-type' seed, these plants will go unnoticed in the first few crops. But if they are not removed in time, they will increase in number and the cotton from them will reduce the quality of the produce obtained from the crop.

Even if the farmer removes such off-types from time to time, he will find that in ginning, seeds get mixed up in spite of all the care taken.

Such seed mixtures will not yield the same quality cotton as the original seed did.

Farmers can buy their cotton seed for renewing their stocks from the stores of the Agricultural Department or other agencies like co-operative societies.

STORE GUR IN ALKATHENE-LINED GUNNY BAGS

THE best method of packing *gur* for storage or for transport is to pack it in alkathene-lined gunny bags.

This was seen in experiments conducted in Bihar with different methods of storing *gur*.

For storing or transporting large *gur* blocks (*chakkis*), pack them tightly in alkathene-lined gunnies with bitumen bonding. Stitch the gunnies firm with a double thread of jute. This way, *gur* will be safe from damage, and will not absorb moisture from outside.

For small blocks or lumps (*bhelis*), use strong gunny bags with double seem and alkathene-lined with bitumen bonding (28 inches x 19 inches . Pack each gunny bag with only about 32 seers of *gur*, and not full. Close the mouth tightly with stitches of a double thread of jute.

In both cases, keep the bags open during the summer months so that the *gur* may be properly dried. Stitch the mouth of the bags before the rainy season starts.

PLANT LARGER ONION SEEDLINGS

PLANT larger onion seedlings and get a higher yield of onions.

This advice to farmers is based on experiments carried out at the Agricultural College Farm at Ludhiana in the Punjab.

To get larger seedlings for planting, you have to sow double the nursery area (1/10th of an acre as against the normal 1/20th of an acre) with the same quantity (normally six to eight pounds) of seed you use. The seed should be distributed evenly. The beds should also get ammonium sulphate and ash.

Watering and weeding are done regularly, and when seedlings are about three inches high, a dilute solution of ammonium sulphate is sprinkled over them (a handful of ammonium sulphate in three gallons of water) and immediately after washed with water to prevent the ammonium sulphate solution from harming the leaves.

The seedlings, which will be double the size of those raised by the ordinary method in six to eight weeks, are transplanted.

At the College Farm, by planting the bigger-sized seedlings raised this way, they were able to obtain 37 per cent more onion yield over the one obtained with the seedlings raised in the normal way.

Your kitchen garden should have

MALTA LEMON

By C.A. THOMAS

YOUR kitchen garden should have one, two or many malta lemon plants, depending upon the size of your garden. The malta lemon will not only provide you with a fruit from which you can make refreshing drinks but also other preserves. The spare lemons you can sell and thus add to your side income.

Malta lemon has an attractive fruit colour. However, it is inferior to other lemons in taste. But in food value, it is a very important fruit. Squashes and pickles are the common products made from malta.

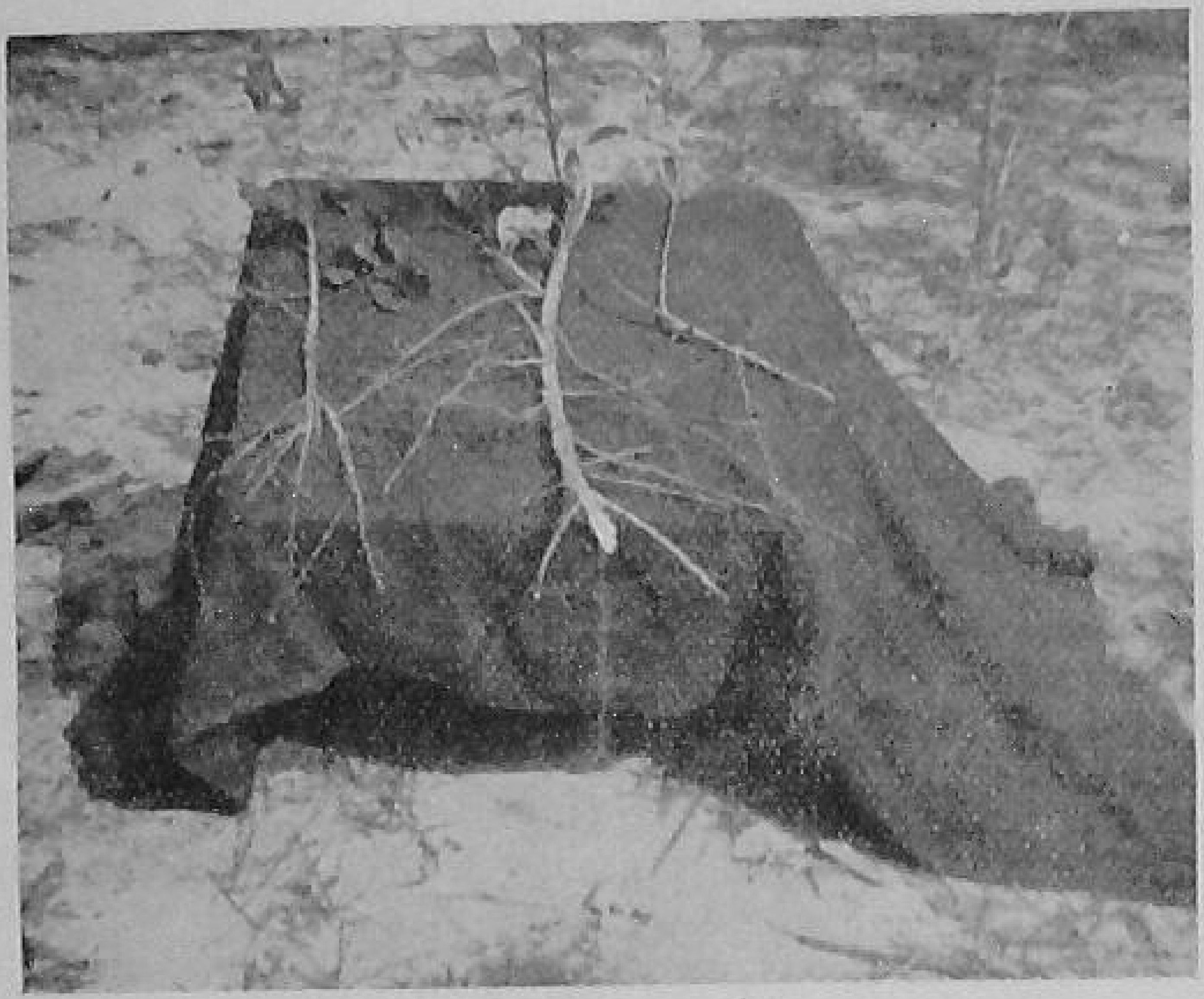
You can grow malta up to an elevation of 3,000 feet. It can come up in the humid coastal areas as well as in the hilly tracts of the tropical region.

Malta lemon is a hardy plant. It has very many branches, the lower ones spreading out horizontally. As such, when you grow it on a plantation scale, give it a spacing of 18 feet. Planting by the square system will mean 134 malta plants to the acre.

Malta is not planted by seed as its fruit is seedless. You have to propagate the plant by air-layering, using 250 polythene film and leaf mould.

For layering use low hanging branches close to the soil for the purpose. Peel out the outer skin of the branch an inch in length all round. Cover the ring portion with moist soil. Roots strike out within

a month. Severe the shoot from the mother plant after the roots have been formed and plant it in the rainy season. For planting, dig three feet cube pits in May. Pits should be spaced out at a distance of 18 to 20 feet. Fill them with equal quantities of rich garden soil, cattle manure or compost and sand. Plant one or two of the rooted cuttings per pit.



Cuttings ready for planting

After the cuttings have established, give each plant a manure mixture consisting of cattle manure and wood-ash and also ammonium sulphate, muriate of potash and superphosphate. Gradually increase the dose of the last three as the plant advances in age.

To a full-grown plant in your kitchen garden, apply 40 kilograms of farmyard manure and 10 kilograms of wood-ash, or $1\frac{1}{2}$ kilograms of ammonium sulphate and $\frac{1}{2}$ kilogram of muriate of potash and $\frac{1}{2}$ kilogram of superphosphate, once a year. It is better to supply this amount in two doses, in July and in December.

If you are in the humid areas of the country, you need not irrigate the plant; but in arid areas, irrigate the maltas at frequent intervals. Once a week during summer and once a fortnight during winter, give maltas a profuse watering.

Malta lemon grows 8 to 12 feet high. It does not need any pruning but stock sprouts and water suckers should be removed in the early stages. No root pruning need be given.

In a medium fertile soil, maltas will generally bear after two years. All full-grown and well-bearing plants produce 500 to 1,000 fruits a year.

BLIGHTS OF POTATO

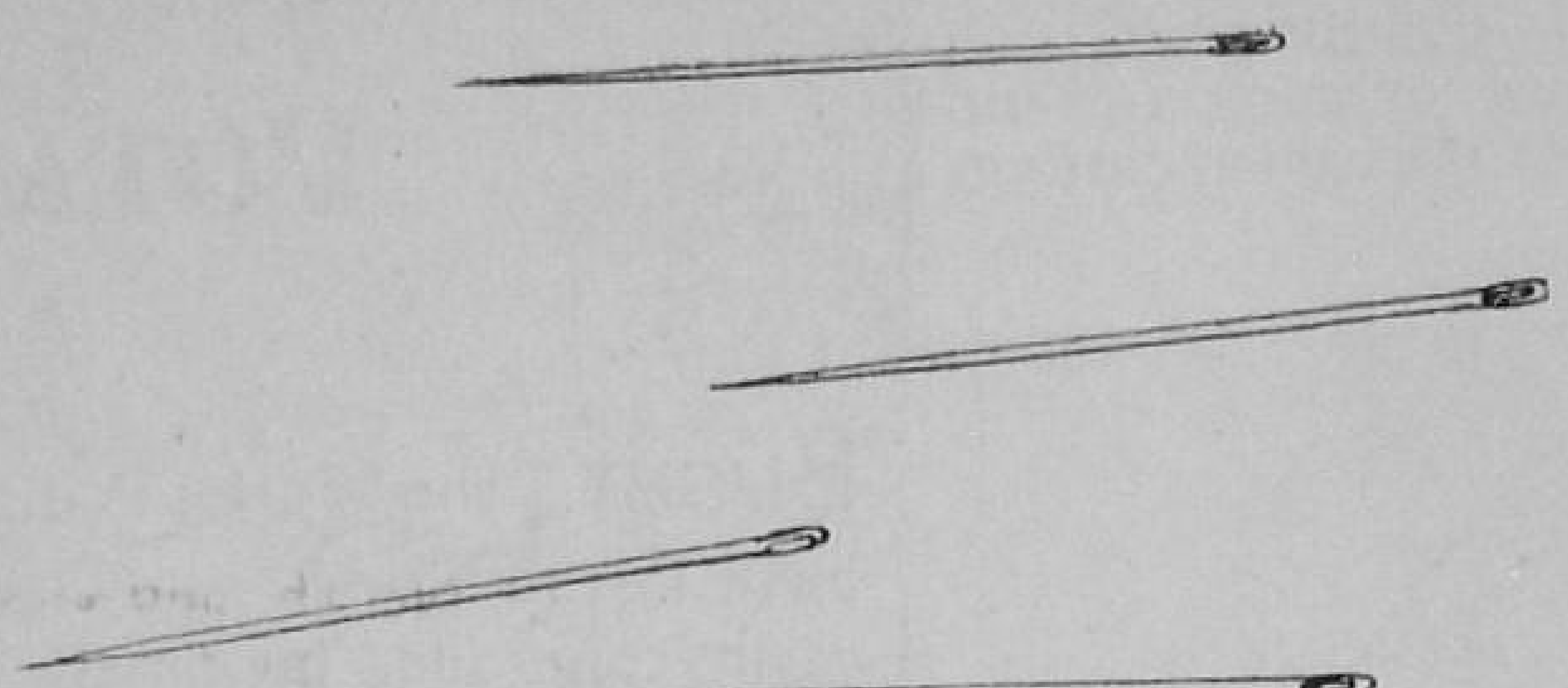
BLIGHT, the serious disease of potato both in the North and the South, can be easily controlled by timely sprayings with Bordeaux mixture or any other copper fungicide.

Blight is a fungus disease, which attacks the potato crop at its early stages of growth (early blight), as well as at the later stages (late blight). Early blight appears in the shape of dark brown or almost black circular spots on the lower leaves. As the disease advances, the leaves roll or curl up and the stalks turn yellow and dry up.

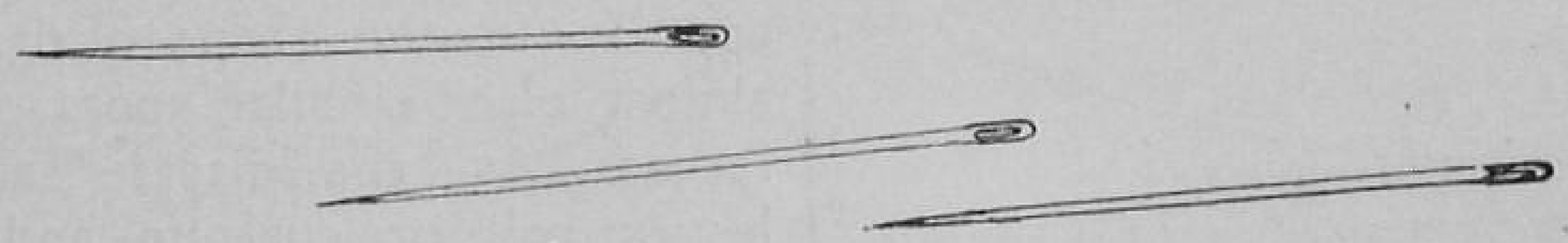
In the case of late blight, which is far more serious, the tips or the margins of lower leaves develop brownish black or purple spots. The disease spreads to all the green parts of the potato plants and within a week, plants die and rot giving out a foul smell.

To control early and late blights, it is advised that the crop be sprayed three to four times with 5 : 5 : 50 Bordeaux mixture or a copper fungicide or with Zineb wettable powder (one pound in 50 gallons of water) at intervals of 10 to 15 days. Fifty to 80 gallons of the spray solution is sufficient for spraying an acre at a time.

Specialists also advise that farmers use only healthy seed potatoes for planting as blight-affected tubers carry the disease to the next crop.



a case for your needles



By KAMLESH PURI

SURELY, you have been wanting to have some sort of a needle case to keep your needles and prevent them from being lost. Here is how you can make a pretty one, in the shape of a lady.

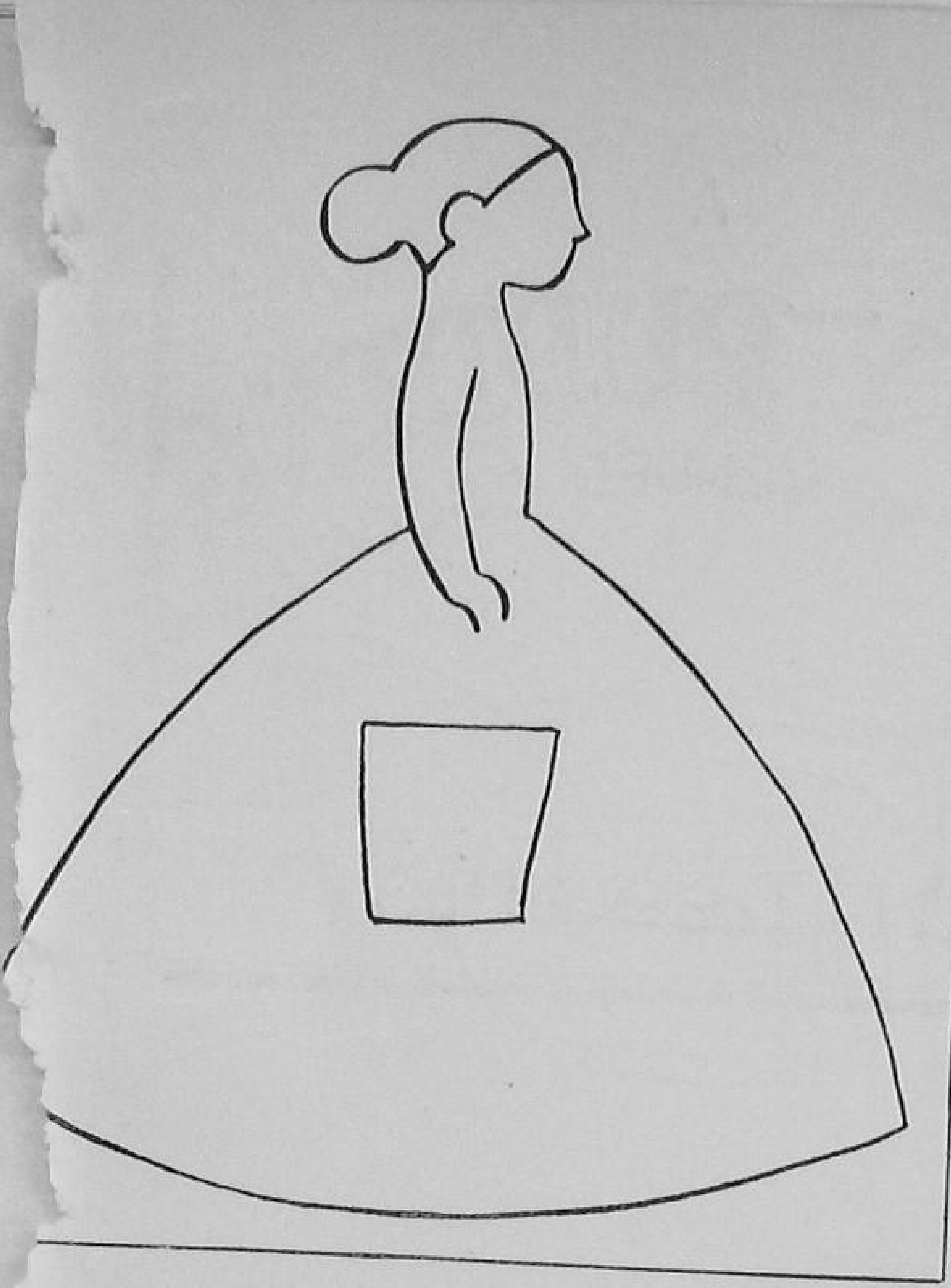
To make this needle case, you need a piece of coloured felt 5 inches by 10 inches, a small piece of flannel, say of 3-inch by 3-inch size and with a contrasting colour, a bit of cotton wool, and some suitable coloured cotton thread.

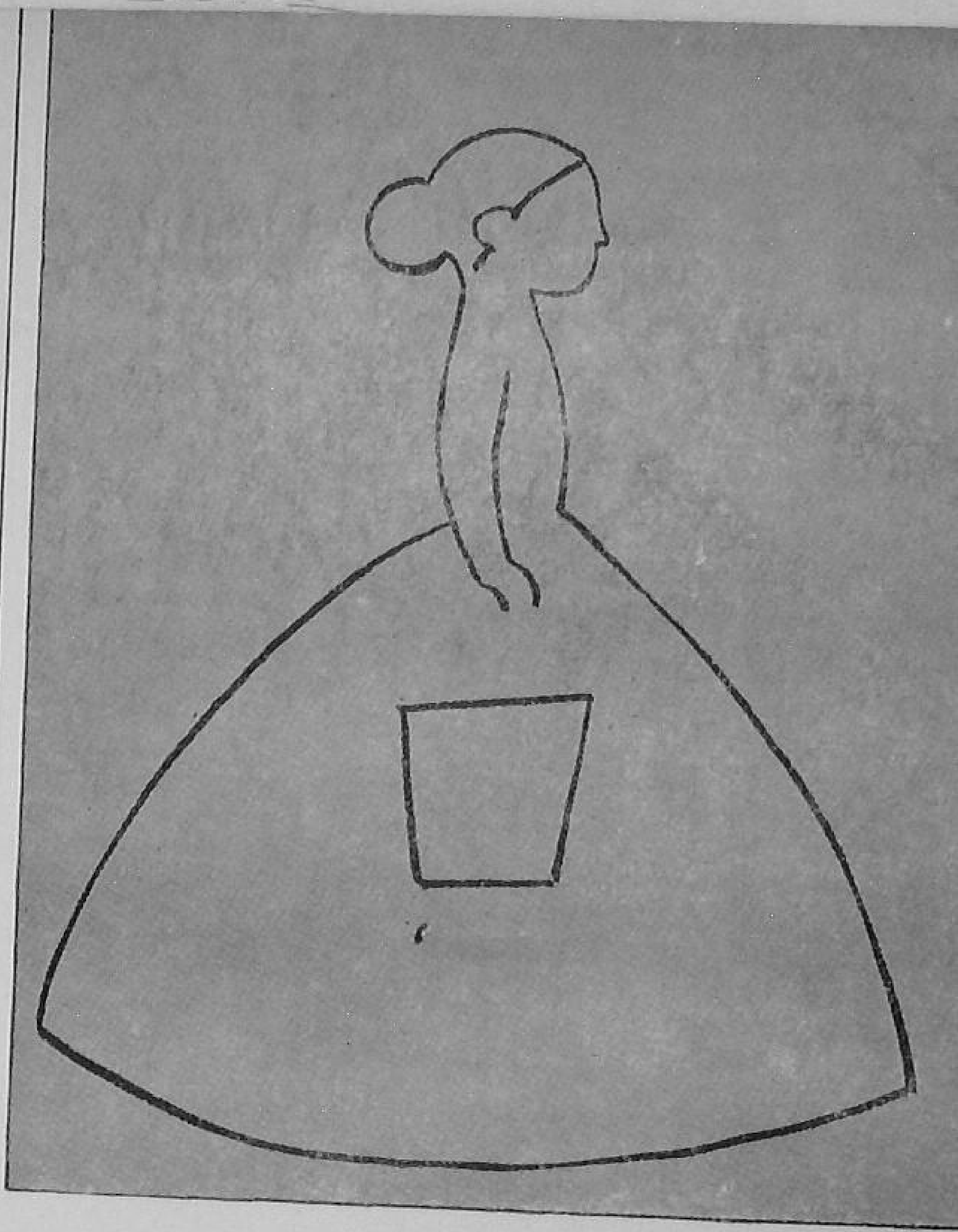
Trace out the outline and cut out two lady-shapes from the felt.

Join the two pieces from waist upwards by button-hole stitch or by overcasting.

Stuff lightly with a little cotton wool.

Cut out two basket-shapes; a circular base, and a handle from the felt and make up into a basket.





Cut out two lady-shapes from the felt; join them from waist upwards, before stuffing with cotton wool

Attach the handle of the basket to the end of the arm.

Cut a leaf of flannel in the shape of the skirt and attach it inside the top edge of the waist.

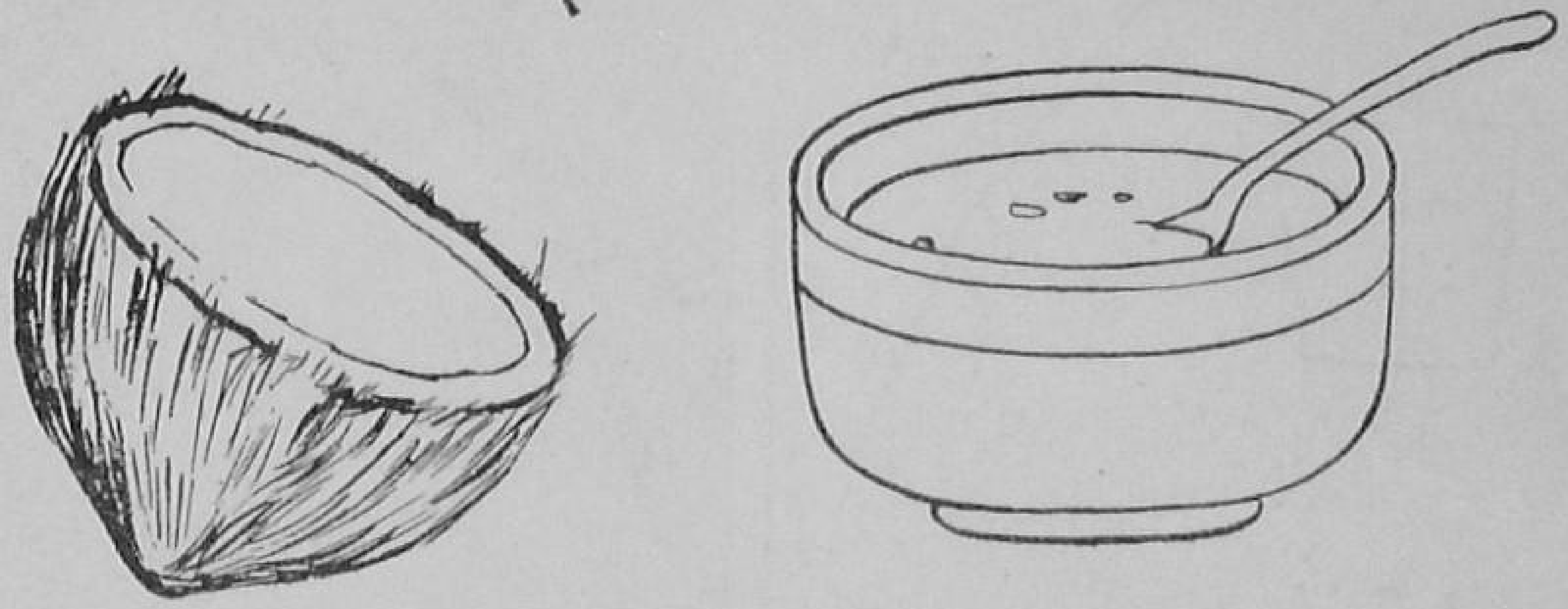
Embroider the lower outer edge of the skirt using four strands of cotton of any colour in lazy daisy stitch giving them knots in the centre.

Make the hair of the lady in black cotton.

Use six strands of black cotton thread for making the hair. The lady needle-case is ready to hold your needles now.

Place a thimble in the basket and stick the pins and needles in the flannel petticoat.

A TASTY PUDDING FROM THE TENDER COCONUT



By R. HALI

IF you can prepare it well, there will be nothing so tasty as the tender coconut pudding, prepared from its kernel. Here is how it is made.

To make this, you will need :

- Five tender coconuts
- Three ounces of *ghee*
- Half a pound of jaggery
- Milk from one coconut
- Half a spoonful of cardamom powder
- A few cashewnuts and raisins

Break open the tender nuts and collect the water with a spoon, and gather the kernel.

Keep the vessel on the oven and fry the raisin and cashew in the *ghee* and take them out.

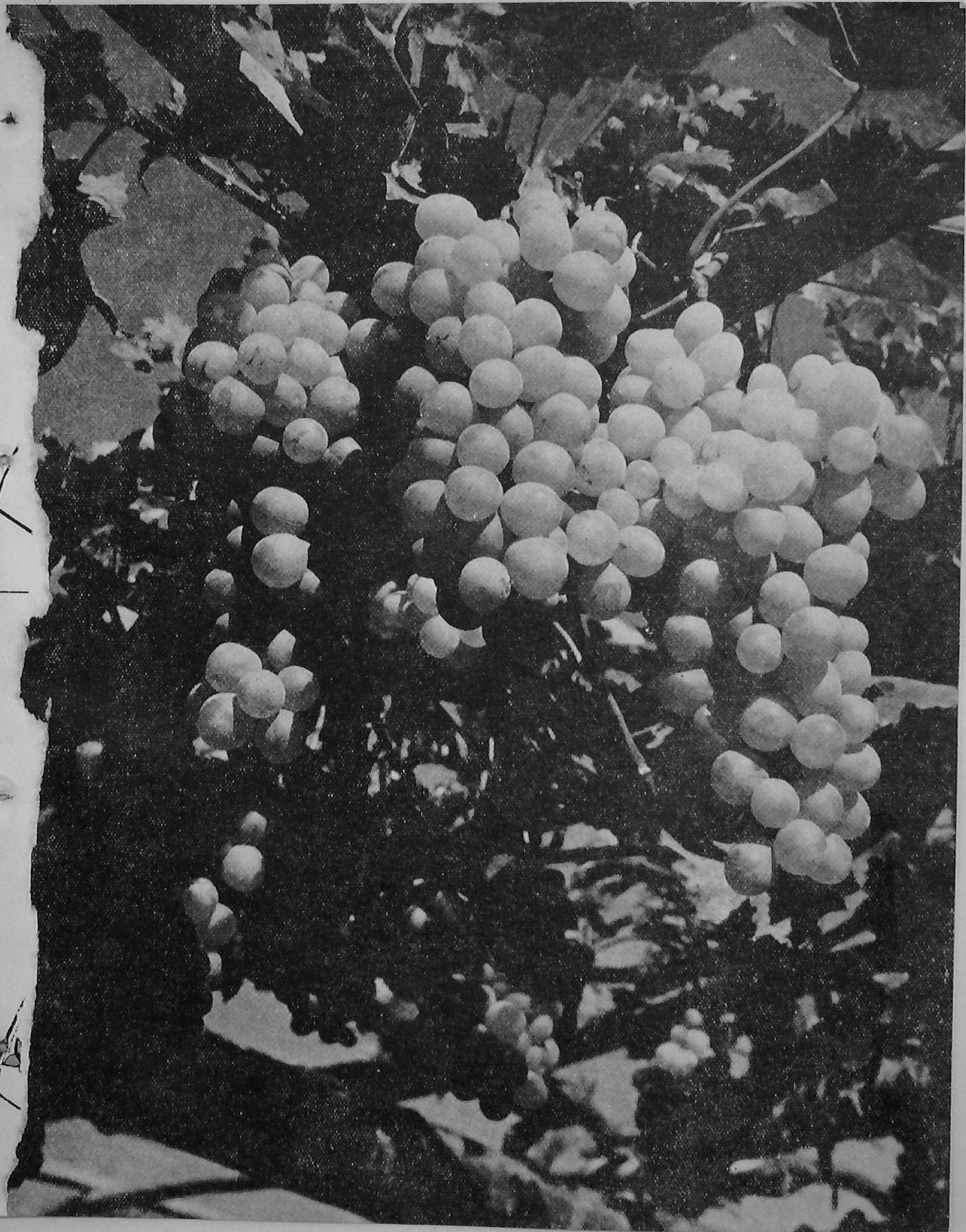
Pour the coconut water in the vessel with jaggery (*gur*) and stir well till it boils.

Once the jaggery melts, put in the tender kernels, warm, and pour in the coconut milk.

Continue the warming till it becomes thick, like a pudding.

Take the vessel from the oven and add the coconut milk. Next put the fried cashew, raisins and cardamom powder. Stir the mixture again.

Your pudding is ready now. Serve it when it is cool.



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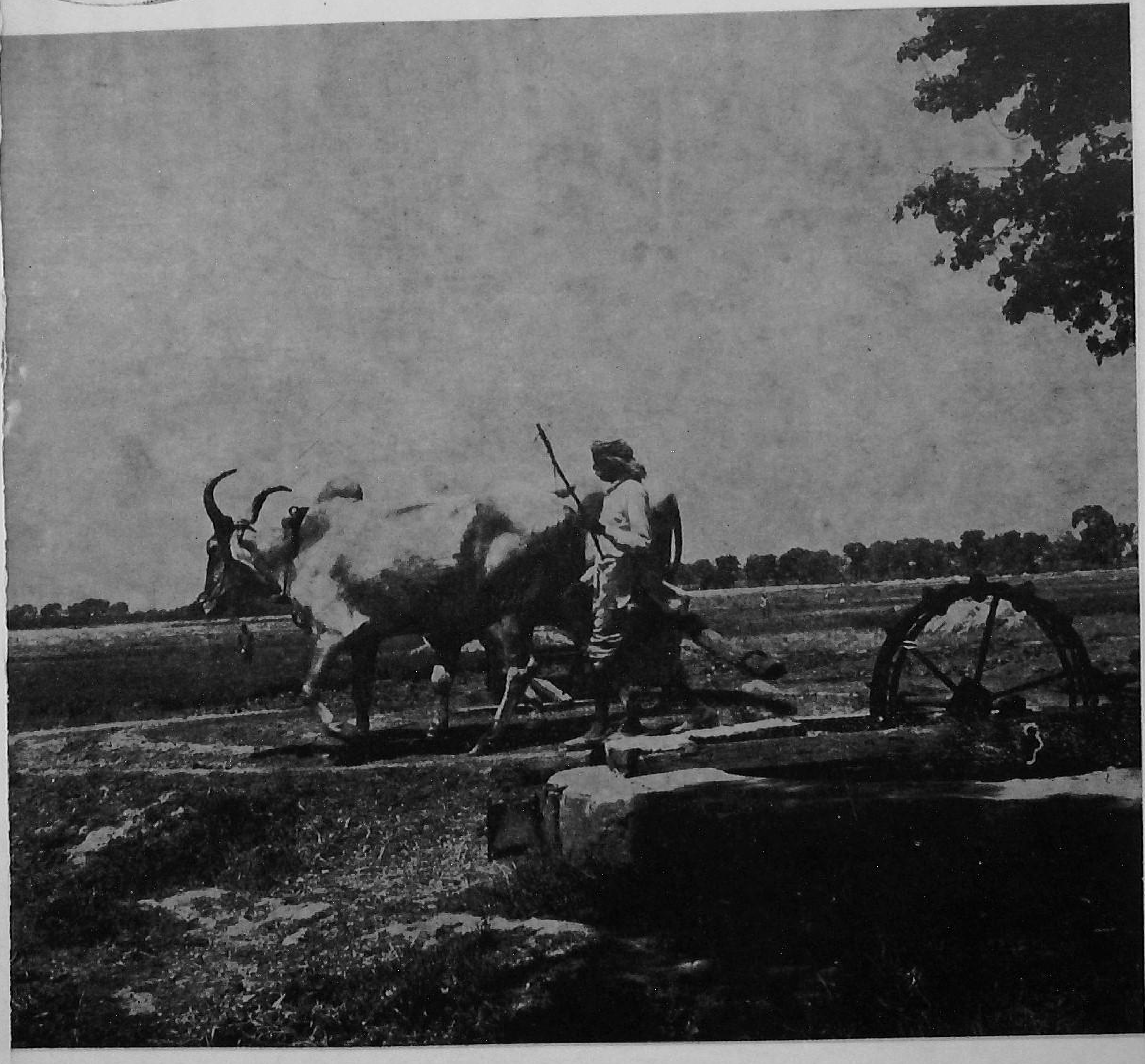

THE FARM AND FARM HOME MAGAZINE May, 1962

THE PICTURE ON THE COVER

Farmers don't need to be told that their crops need enough water to yield well. But what many of them have now to learn is when to irrigate the crop and when to stop. From research we learn that a crop gives good yields even with a few irrigations but given in the right time and in the right quantities.

Photo by R. K. Paul

EXTENSION

THE FARM AND FARM HOME MAGAZINE

Vol. II May, 1962 No. 11

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Some timely CROP PROTECTION tips

By D. B. REDDY

WHETHER you are busy threshing your *rabi* crops or getting ready for *kharif* sowings, here is a piece of good advice to you: Take steps to protect your crops against pests and diseases right from now !

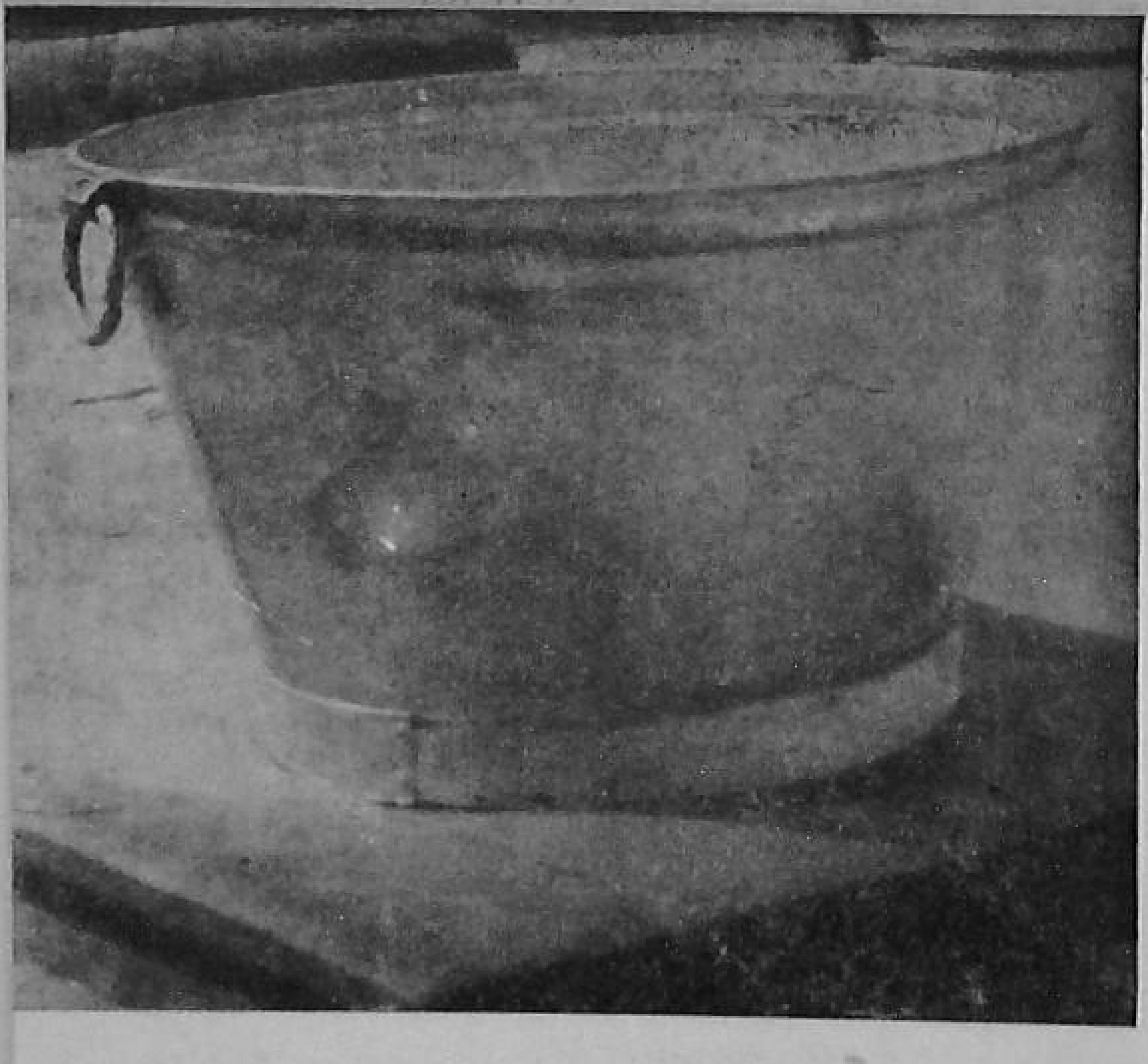
You ensure a healthy crop when you sow good and healthy seed. A seed may look healthy, and yet carry diseases with it. These diseases will affect the germinating seed and the growing seedlings. The diseases from the seed may not only attack the crop, but also spread to the healthy crop in other fields.

Paddy, *jowar*, wheat and barley, all have diseases which the seed can carry to the next crop.

Let us take paddy for an instance. The diseases which the seeds carry are foot rot, brown leaf spot and blast. Similarly, *jowar* seed may carry grain smut disease. This fungus will turn the grain in the ears into a black mass. Wheat and barley suffer from loose smut which, again, is carried by seed.

HOT SUMMER DAYS ARE THE BEST TIME TO TREAT WHEAT AND BARLEY SEEDS AGAINST LOOSE SMUT

To do so, soak the seed in water for four hours



spread the soaked seed thin on a clean floor or cloth and dry it completely in the hot sun

To free the wheat seed of earcockle galls place the seed in water and stir well

RICE AND JOWAR

The diseases of rice and *jowar* can be treated with chemicals (seed-dressers) a few days before sowing. This is how you treat the seed :

Weigh the required quantity of seed and place it in a seed treating drum or an earthenware, *chattie* or *ghara*. Fill this only two thirds. Then weigh the required quantity of the chemical and put it in the drum or *chattie*. Close with a tight-fitting lid or a thick cloth.

For paddy, use one *chattack* of organomercuric seed-dresser (1 per cent active material) for every 25 seers of seed.

If you are treating *jowar* seed, use 1 *chattack* of fine sulphur powder for every 15 seers of seed or 1 *chattack* of organomercuric seed-dresser for every 25 seers of seed.

Mix the seed and the chemical thoroughly by rotating or rolling or shaking the seed drum or any other container for 3 to 5 minutes.

Do not consume the treated seed or feed your animals with any. It will be poisonous.

The galls will float to the surface which you should remove immediately

CATERPILLARS

When the rains come, you will find grasshoppers and hairy caterpillars, especially the red hairy caterpillar, damaging most of the crops. The last is particularly dangerous. Protect your *kharif* crops against these pests.

Young grasshoppers can easily be killed if you dust 5 per cent B.H.C. If grown up grasshoppers are found, use 10 per cent B.H.C.

It is difficult to kill hairy caterpillars unless you kill them young. Dust 10 per cent B.H.C. or spray 0.025 per cent parathion (one liquid ounce of 50 per cent parathion in about 2½ kerosene-tinfuls of water). Kill

Many diseases of paddy and jowar can be got rid of by treating the seed with chemicals before sowing

these insects wherever found—in the crop, on the bunds or in fallow lands. Ask your neighbours also to do the same.

WHEAT DISEASES

Wheat and barley suffer from loose smut (*kangiari* or *chhidra kandua*). This disease is carried by the seed and hence you should treat the seed before sowing during one of the hot days of May or June.

Take some water in a tub, a bucket or any other container and put the seed in it early in the morning. Let it soak for 4 hours. Then remove the seed from the water, drain it and spread thin either on a clean floor, a cloth, a *durrie* or a tarpaulin. Let the grain dry in the hot sun. Turn it once or twice. When the seed is completely dry, store it. This way, the loose smut is got rid of.

Sometimes, wheat also suffers from earcockle disease. Here, instead of good and healthy seed, you will find a round gall-like structure. As in the control of loose smut, place the seed in water and stir well. The galls will float to the surface. Remove these immediately with the sieve and burn them. See that you do not delay in removing the galls, as otherwise they may sink to the bottom.

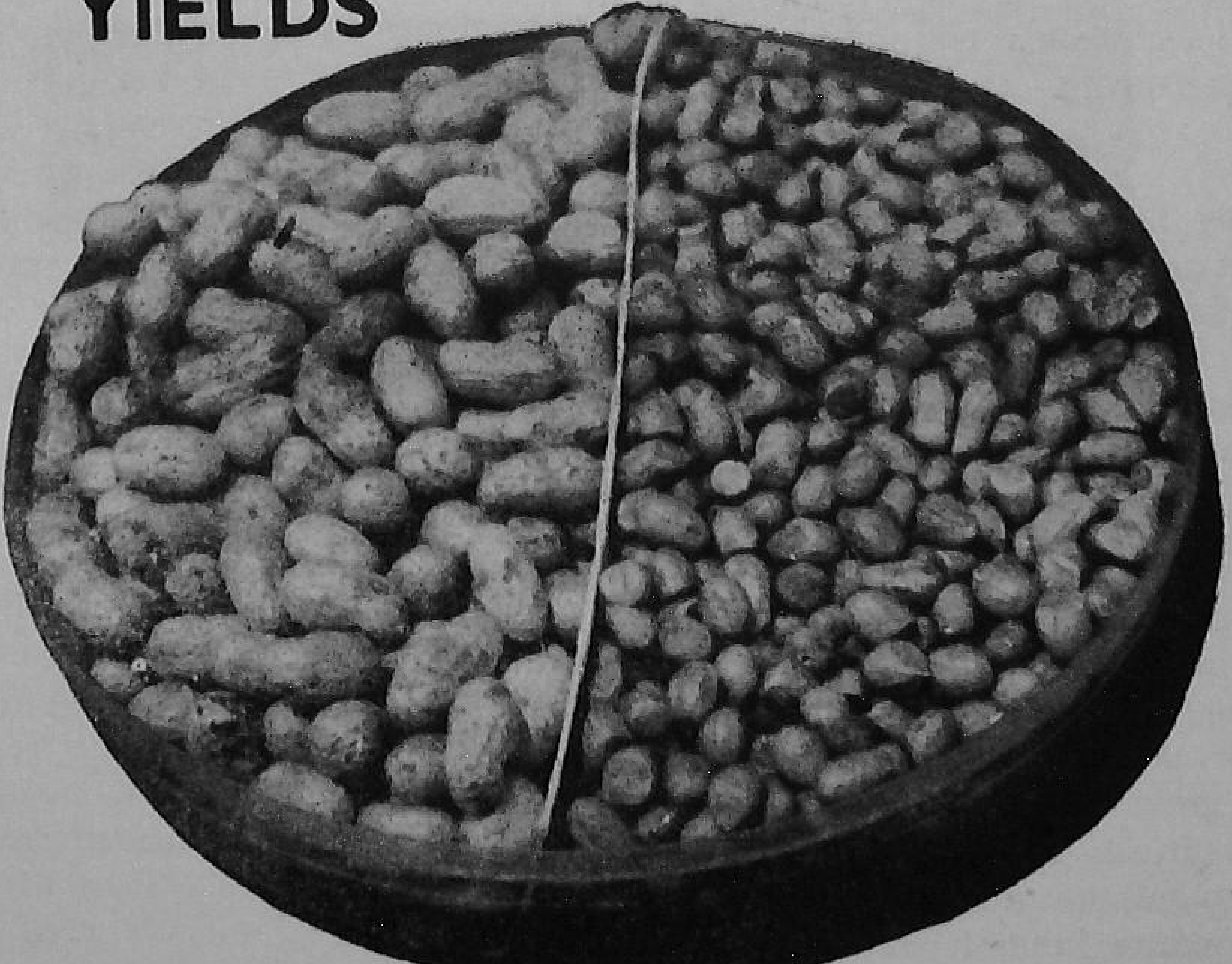
WARNING

When you use organo-mercuric chemicals, B.H.C. and parathion for treating seed, remember that these are poisonous. Handle them and use them with great care.

BETTER PRACTICES FOR BETTER GROUNDNUT YIELDS

WITH groundnut, there is no reason why you should not get good yields. And if you are already getting good harvests, your aim should be still better yields. Improved practices will help you get better and still better groundnut harvests.

The improved practices include better cultivation, adequate manuring, use of better varieties, seed selection, pest and disease control and also better farming plans such as mixed cropping and rotation. If you follow all these, you are sure to get high yields from groundnut.



Groundnut is mostly grown in *kharif*. You can also grow it as a summer crop with profit, if you have irrigation facilities. In Madras, Andhra Pradesh, and in some other states they grow groundnut under irrigation from January-February to March-April. An irrigated crop gives double the yield of what is obtained from a rainfed crop.

SOIL FOR GROUNDNUT

Unlike many other crops, groundnut can be grown on almost all kinds of soils. However, it gives its best when grown in light sandy loams. The soil should be well-drained, loose and friable with enough of calcium (lime) and a moderate amount of organic matter in it. Groundnut grown on lighter soils gives a higher shelling percentage too.

Avoid stiff heavy clay soils for groundnut. Regions with very high rainfall as parts of West Coast are also not quite suitable for groundnut-growing.

ROTATION

Many farmers grow groundnut after groundnut on the same land. This is no good. It brings down not only the yield but also the quality of the nuts, especially when the crop is not manured adequately. Moreover, it helps the spread of pests and diseases.

Rotating groundnut with such crops as paddy, *ragi*, sorghum, *bajra*, cotton and the like have many advantages. For groundnut being a legume, not only raises the fertility of the soil, but also gives a good green manure for the crop you raise later. Cotton or a cereal grown after groundnut yields more than it does in any other system of cropping. In fact, groundnut-cereal rotation is ideal ! Madras, Andhra Pradesh and Maharashtra farmers are doing it with advantage, and others can also follow the rotation with profit.

Mixed cropping or growing groundnut mixed with other crops is quite popular. *Tur*, Sorghum, maize, cotton, castor, *bajra* and *tenai* are the crops with which groundnut is grown mixed.

For groundnut no deep cultivation is needed. But a good tilth, say to a depth of about six inches, is necessary for good germination.

LAND PREPARATION

Plough the land two to six times to get a good seed-bed. Give two ploughings soon after harvest of the previous crop and then follow it up with light cultivation at regular intervals, depending upon the showers received during summer.

In Madras, four to six ploughings are sufficient for moist soils, while in Andhra Pradesh, the required tilth is obtained either by ploughing two or three times, or by working a *gorru* (tined harrow) and a *guntka* (blade harrow) alternately. In dry tracts farmers plough only once, work a local tined harrow next, and then a blade harrow. In black soils, they harrow a number of times to get the needed tilth.

Whatever method you follow, see that you prepare a fine seed-bed and that too well in time.

MANURING

Don't forget to feed your crop well, especially with potash and lime. As groundnut removes plant-foods from the soil in large quantities, you need to make good the loss through proper manuring (either by applying manure to the crop preceding groundnut or the crop itself). Since it is a leguminsous crop, it does not need nitrogenous manures generally.

Apply about five to ten cartloads (five tons) of cattle manure per acre. Organic

manure helps in maintaining soil texture. If, however, cattle manure is not available, you can apply 1/3 hundredweight of ammonium sulphate (10 pounds nitrogen) instead, to a rainfed crop.

Where the soil is dry and sandy and cannot hold the moisture, apply tank silt at 30 to 50 cartloads (once every three to five years) as many farmers do. If practicable, pen sheep and cattle in such soils.

Groundnut gives very good results when fertilizers are applied over a basal dressing of cattle manure. Follow this schedule :

> For a rainfed crop: Five cartloads of farmyard manure or compost supplemented with one hundredweight of superphosphate (20 pounds of phoshoric acid) and half hundredweight of muriate of potash (35 pounds of potash) per acre.
>
> If the quality of cattle manure is poor add a hundredweight of ammonium sulphate (10 pounds nitrogen).
>
> For an irrigated crop: Ten cartloads (5 tons) of farm-manure or compost, supplemented with three-fourth hundredweight of ammonium sulphate (15 pounds of nitrogen) in addition to one and a half hundredweight of superphosphate (30 pounds of phosphoric acid) and three-fourth hundredweight of muriate of potash (50 pounds of potash) per acre.

VARIETIES

You cannot hope to do much unless you grow a better variety.

As you know, there are two main types of groundnut. One is 'bunch' or erect type, whose branches grow somewhat erect and the pods appear in a cluster, confined to the base of the plant. The other is spreading or runner and as the name indicates, its primary branches trail along the ground and the pods are borne along the length of the branches.

The bunch varieties take three to four months to mature, while spreading ones four to six months or even longer, depending upon the soil, rainfall and climatic conditions.

Spreading varieties give better yields than the short duration ones. But these cannot be grown unless the rainfall is well-distributed for 4½ months. Whereas you can easily grow bunch types where rainfall is not very well distributed for over a long period of time. Grow bunch types also under lift irrigation system where there is not much water in summer.

Improved varieties, both in bunch and spreading types are available with your State Department of Agriculture.

SEED FOR SOWING

Select healthy pods from a well-matured crop. Sow the seed after removing their shell.

Shell the pods with hand to avoid injury to kernels a week before sowing. Hand-pick the kernels to eliminate diseased, broken or shrivelled ones.

To ensure a good germination and to protect seedlings from pests and diseases in the soil, treat the seed with 'Ceresan' or 'Agrosan' at four ounces per 100 pounds of kernels. Mix the seed well with the fungicide powder.

SOWING THE SEED

Sow the crop in lines, preferably with a seed-drill. Line-sowing with a seed-drill helps regulate the seed-rate as well as distances between plants.

A proper seed-rate and spacing are very important in groundnut. Sowing too thick is as bad as sowing too thin.

For Sowing, Select healthy seeds and hand-shell them

If it is bunch type, sow with a spacing of a six by six inches (12 inches by 6 inches in Maharashtra). For spreading varieties you can adopt a nine by nine-inch spacing.

You will need about 80 to 100 pounds of seed for sowing bunch varieties and if you are drilling the same. Where dibbling is done, 120 pounds will be needed.

For drill-sowing the spreading varieties, 70 to 80 pounds is enough and 90 pounds if you are to dibble.

You can adopt a lower seed-rate if you are raising the crop under irrigation.

Sow the seed two to three inches deep in light sandy soils and to about 1½ to 2 inches on heavier soils. Remember that the depth will be lesser where soil has plenty of moisture than where it is moderately dry.

A little firming of soil over the seed you sow is important; pass a brush harrow or a long-bladed harrow across the lines to achieve this.

INTERCULTIVATION

Though the nature and number of intercultivations given to the groundnut crop depend on the condition of the soil and the amount of rainfall received in a particular area, normally, two hoeings and weedings should be given.

Give the first intercultivation three weeks after sowing, and the other a month later. The first one will help remove weeds and enable the soil to store more moisture, and the second will make the soil loose and help the 'pegs' (stalk of pods) get into the soil easily.

In the case of the bunch type, earth up the plants at the time of the final intercultivation. It will increase the formation of pods.

Before you harvest, pull out a few plants and examine whether the pods are really mature or not

Better avoid any hoeing or weeding after the plants have flowered and pod formation has started.

IRRIGATION

Irrigate the crop at regular intervals throughout the crop season up to maturity.

Give a light irrigation on the third day after sowing the summer crop.

In all you may need to give six to eight irrigations to the short-duration bunch type and 10 to 12 irrigations to the long-duration spreading type.

PEST AND DISEASE

Groundnut is attacked by pests like red hairy caterpillars, leaf miner, aphids and thrips. You should be on the look-out for these and take early steps to control them.

The red hairy caterpillar causes a heavy loss of crop, especially in Madras, Andhra Pradesh and Mysore States. Watch the crop all the time and dust it with ten per cent BHC as soon as you see the pest. In case the attack has taken a severe turn and grown up caterpillars are seen, spray the crop with 'Folidol' at the rate of one ounce in six gallons of water.

When a dry period follows, it is quite likely that leaf miner (*surul*) may visit your field. Protect the crop by dusting five per cent (15 pounds per acre) DDT. Repeat the treatment two to three times, if required.

Another pest which appears occasionally are the thrips. Thrips cause curling of leaves. You can control the pest by dusting ten per cent BHC.

The most common disease of groundnut is the *tikka* leaf spot. This disease generally appears at later stages of crop growth. If you see its attack, spray the crop with fine sulphur dust (320 mesh) per acre. You may need to give two or three treatments depending on the nature of the attack.

HARVESTING

Harvest the nuts when fully mature. When the vines turn yellow, leaves dry up and shed you know that the crop is ready for harvest. Pull out a few plants from the field and see if the pods are mature, and free from extra moisture in the shell. The shell should crack when pressed and you will see a dark colour on the inner surface of the shells in the well-matured pods. If harvested before time, the crop gives a low as well as a poor quality produce.

After harvesting, dry the pods in the sun for about seven days before storing or sending to the market. If pods are stored when still wet, the kernels get rancid. You will have to air dry the pods before putting them out for sun drying. If the weather is moist, this should be done in a well-covered shed.

If you are storing the pods for seed purposes, see that they are fully mature and well-dried in the sun for about ten days.

Follow all these practices and yours will be a crop that will bring high returns.

STORE YOUR GRAINS SAFE

Now is the time when you will be storing your *rabi* harvest. Store it in a way so that rats and insects cannot get at it.

Contrary to what many believe, grains do not carry insect in them except in the case of peas or *chana*. Insect-attack takes place in storage godowns only. To prevent insect-damage in storage:

Clean the godown and all storage containers like *khatties*, *gharas*, bags etc., thoroughly.

Dry the grains well before storing.

Store only clean and healthy grains and in improved storage receptacles.

Do not store old and new grains together; store them separately.

Never store infested grains. They will be a source of attack on the sound grains.

Keep the storage godowns and its surroundings clean.

Inspect the stored grains frequently, especially during the rainy season. Expose the grains once or twice to the sun, if possible, this helps in keeping the grains healthy.

Store the grains in places which are not usually exposed to rain, rain splashes and high humidity. Do not open the storage receptacles too often. Keep the lids or the covers tight.

Where facilities for fumigation exist, infested grains should be fumigated under expert supervision. Grains stored in bags and put in stacks may be dusted lightly with five per cent BHC once or twice in the season.

Store the grains in rat-proof containers and take measures for rat control either by using rat traps or by poison baiting. Poison baiting should be done with great care and grains etc., should not be allowed to be contaminated with it.

—D. B. R

By A. B. MITRA
and J. N. MAJUMDAR

FARMERS facing the problem of finding green fodder the year round for their cattle will find a good answer in cowpea (*lobia*).

Cowpea can not only be raised on all types of soil (light soils being the best), but you can raise two crops of it during the year. Normally, cowpea is a warm weather crop, raised from May to August. It is a legume, does not need much care, and the fodder is liked by cattle.

You can grow cowpea in a light soil or clay or loam. You can't get the best yield from a very rich soil, however.

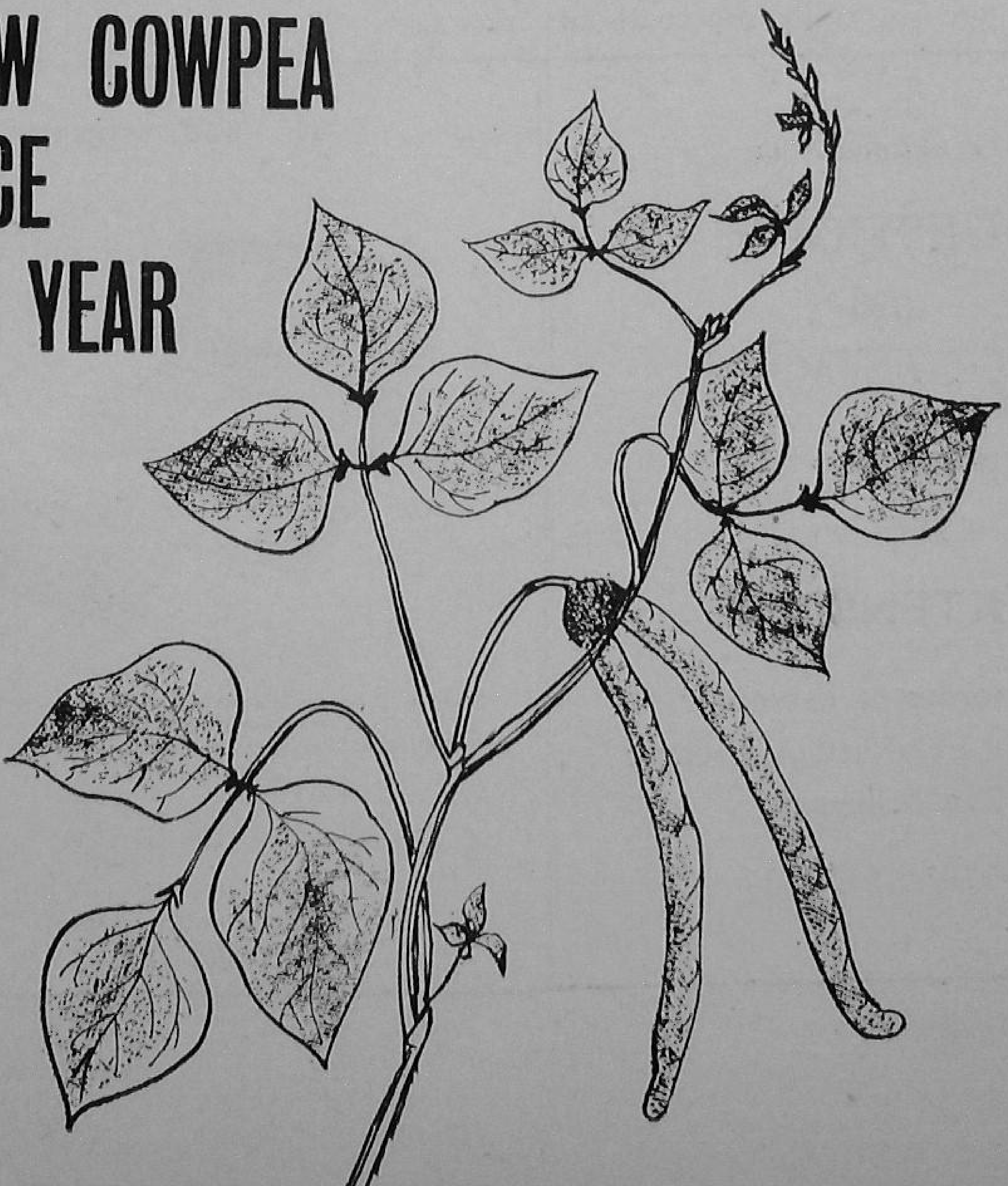
Cowpea is of two types ; The Dwarf Bushy type with small erect pods grows very quick and yields more fodder than the spreading type.

HOW TO GROW

Prepare your land by ploughing three or four times in May and apply 150 maunds of farmyard manure and 20 pounds of phosphoric acid (as superphosphate) during land preparation.

Sow 10 to 12 seers of seed per acre in early June when the rains start. Sow the seed in lines three feet apart and with a

GROW COWPEA TWICE IN A YEAR



spacing of six to eight inches in-between the seeds in the line.

If you have only a small plot of land for cowpea, better dibble the seeds in mid-May at a distance of three feet each way. This way you will need only about three seers of seed per acre.

Irrigate once or at the most twice till the rains come.

The flush of the crop will come up by the end of June. It will not require any interculture.

During July-August, hairy caterpillars may attack the crop and eat away the leaves. Watch for these caterpillers and control them by dusting 10 per cent BHC at 14 pounds per acre as soon as you notice the pest.

Harvest the first crop by the first week of August, and you can easily expect about 250 maunds of green fodder to an acre. If you want to feed the fodder to your animals green, harvest as and when needed. You can have three to four cuttings of cowpea in six to eight weeks.

To raise the second crop of cowpea, give only two ploughings after the first harvest.

No manuring would be needed for this crop.

Sow the seeds in the second week of August in lines as you did for the first crop. Allow the crop to grow till the third week of October when you will be able to harvest about 150 maunds of green fodder per acre.

If you find it more convenient to harvest the entire crop at a time, you can make a good silage out of it and feed your animals during the following summer when fodder gets scarce.

We welcome your

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and
SUGGESTIONS

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NOW THE BAKHAR IS ALL STEEL

By D. N. KHERDEKAR

WHY *bakhar*, a wooden harrow with a steel blade, is so popular in the Deccan is due to one very good reason. It is a multipurpose implement. You can use it as a cultivator, harrow, leveller and sometimes even as a seed-drill.

In fact in the black cotton soils, it is more popular than even a country plough.

Now to make this useful implement popular in other states also, particularly in the north and east India, these *bakhars* are being made in all steel. Such a *bakhar* costs Rs. 45.

An all-steel *bakhar* has two advantages. One : it is more durable and two: it is cheap.

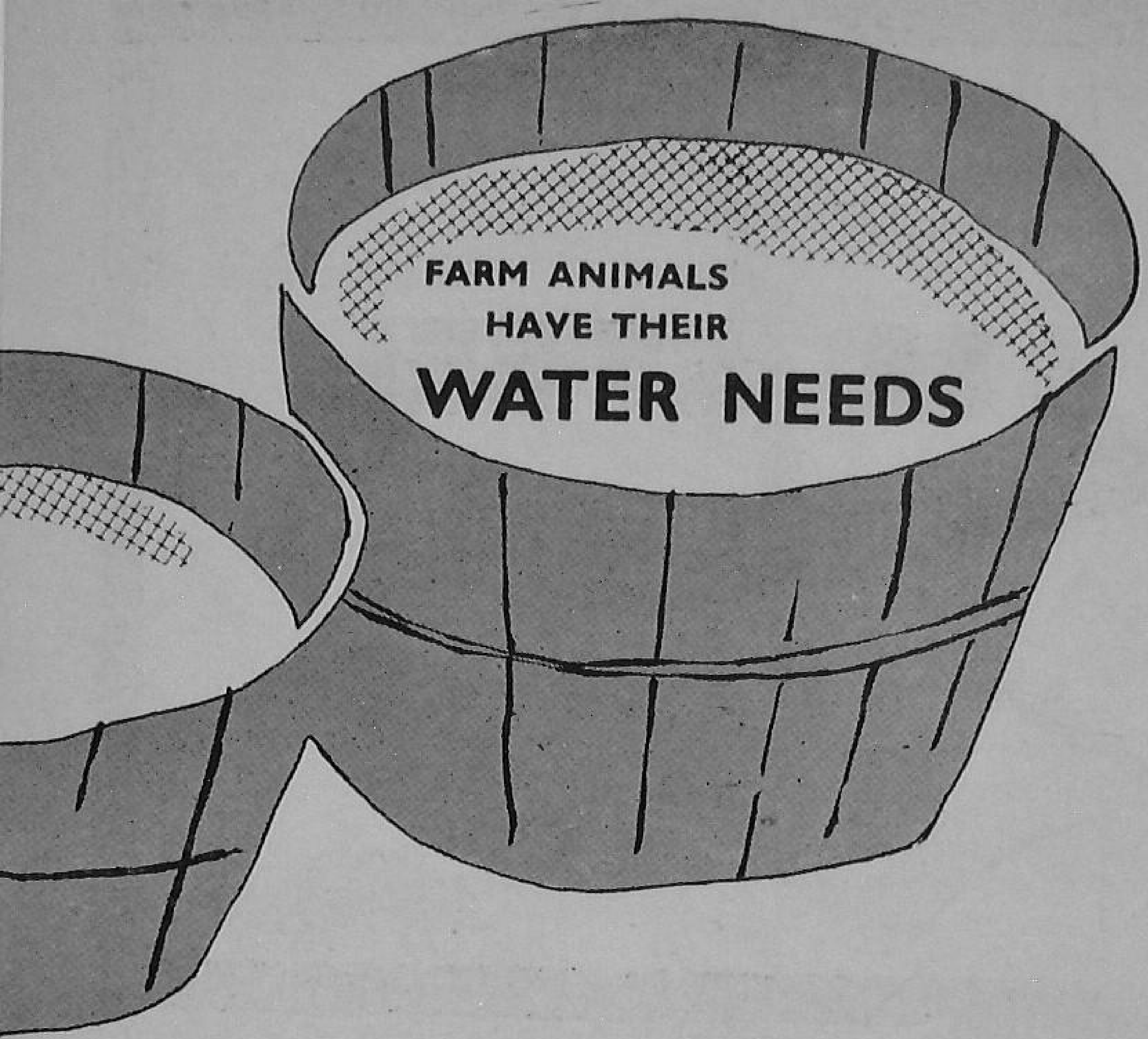
The body of a steel *bakhar* is made of a steel plate bent in a 'U' form. To this, a beam and a handle are attached.

Two steel tines are bolted on to the body to hold the ends of the *bakhar* blade. The angle that the tines make can be adjusted by means of three holes provided in the body.

You will find this *bakhar* very useful in preparing a seed-bed. In case the soil is of heavy type, you can add a weight to the implement or you can stand on it and work it.

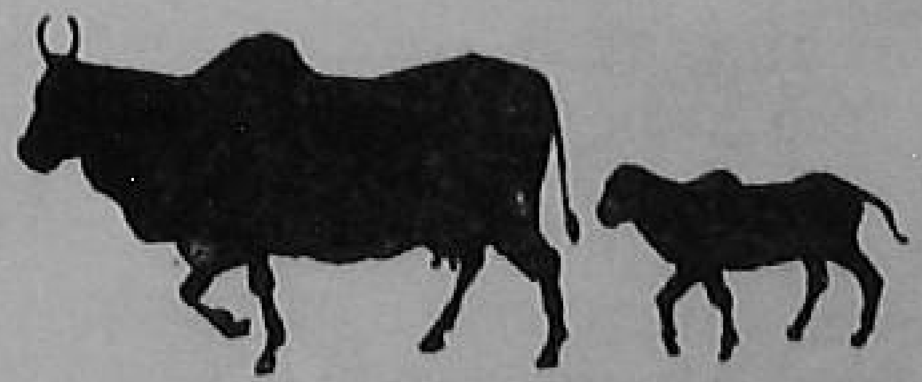
With a pair of bullocks a *bakhar* with a 24-inch long blade, covers about 2 to 2½ acres in one working day of eight hours. You can easily take out the blade and get it sharpened by a village blacksmith.

FARM ANIMALS HAVE THEIR WATER NEEDS



THIS summer, as in every summer, make it a point to see that your farm animals get enough of clean water to drink. Animals which don't get enough water suffer badly. You can't get good work out of such animals.

Cows in milk and young growing cattle require the largest amount of drinking water. Each of such animals needs something like 50 to 75 seers of water a day depending on the size, the nature of food, the temperature and the quantity of milk given. Usually, a cow drinks four to five and a half pounds of water (including the water in her feed) for each pound of milk she gives. She may drink as much as 80 per cent more in the hot weather !

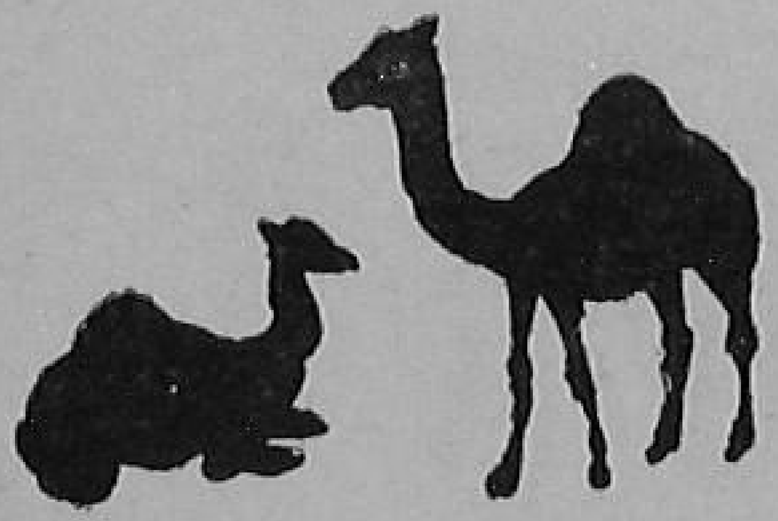


Cows need to be watered twice a day. But now in hot weather they would need it thrice a day. Provide enough clean water for your cows within their easy reach so that they can drink any time they like.

If you own a few sheep or goats, remember that each of them needs $1\frac{1}{2}$ to $2\frac{1}{2}$ seers of water a day depending on the season and the type of feed. During summer, when they live on dry feed, they need more water. Goats in milk need also more, depending on the quantity of milk they give. During summer

three waterings from the troughs would be enough to keep your goats in health. Make clean water available in earthern pots at all times in the pens. The water in such a pot will keep cool during summer.

A camel is known as the ship in the desert. No doubt he can do without water



for quite a number of days at a stretch, but he too can not keep on working on a short water supply without breaking down. Different types of camels differ in their capacity to withstand thirst. Camels used to frequent supply of water do not stand long thirsty periods. So do not forget to provide enough drinking water for your camels. Camels are usually taken to water twice in hot weather. In the desert areas of Rajasthan camels often go without drink for two to three days. In Bikaner where camels are fed with *bhoosa*, they are given water daily. In summer give water to your camels twice a day—both morning and evening.

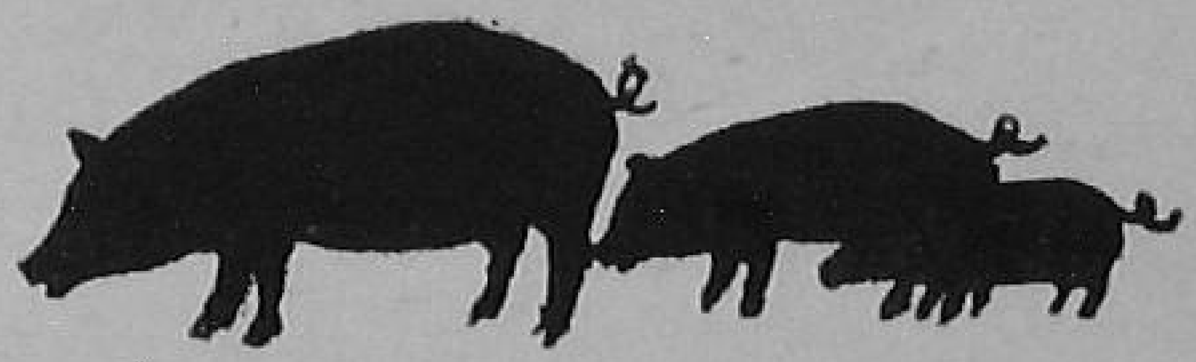
A camel generally drinks about 15 to 40 seers of water a day. But it may vary under different conditions. A thirsty camel, which has not taken a drink for long, can even take 100 seers of water at a stretch.

*Do not allow a camel to drink when it is hot after work.

*Rest the animal and allow it to cool down before taking to water.

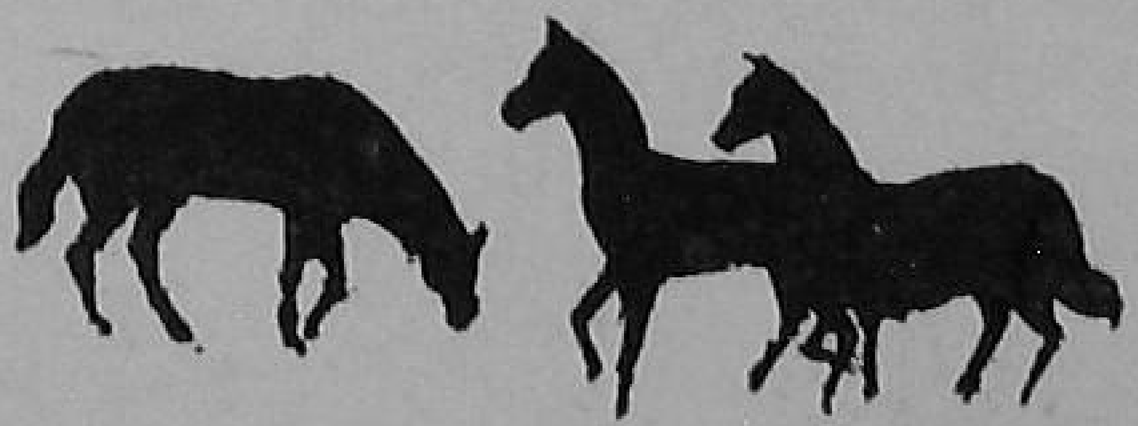
*Do not take a camel for a drink to a pool infested with biting flies. Better water them from a pail.

Pigs also need plenty of water to drink. A pig with a body weight of 100 pounds,



drinks about two to six seers of water a day. So give plenty of water to your pigs, twice daily in troughs or pails. If you are giving enough watery feeds to your pigs, you need not provide them with extra water separately.

If you have a horse, it needs 25 to 75



seers of water a day, and in hot summer days it will need twice as much.

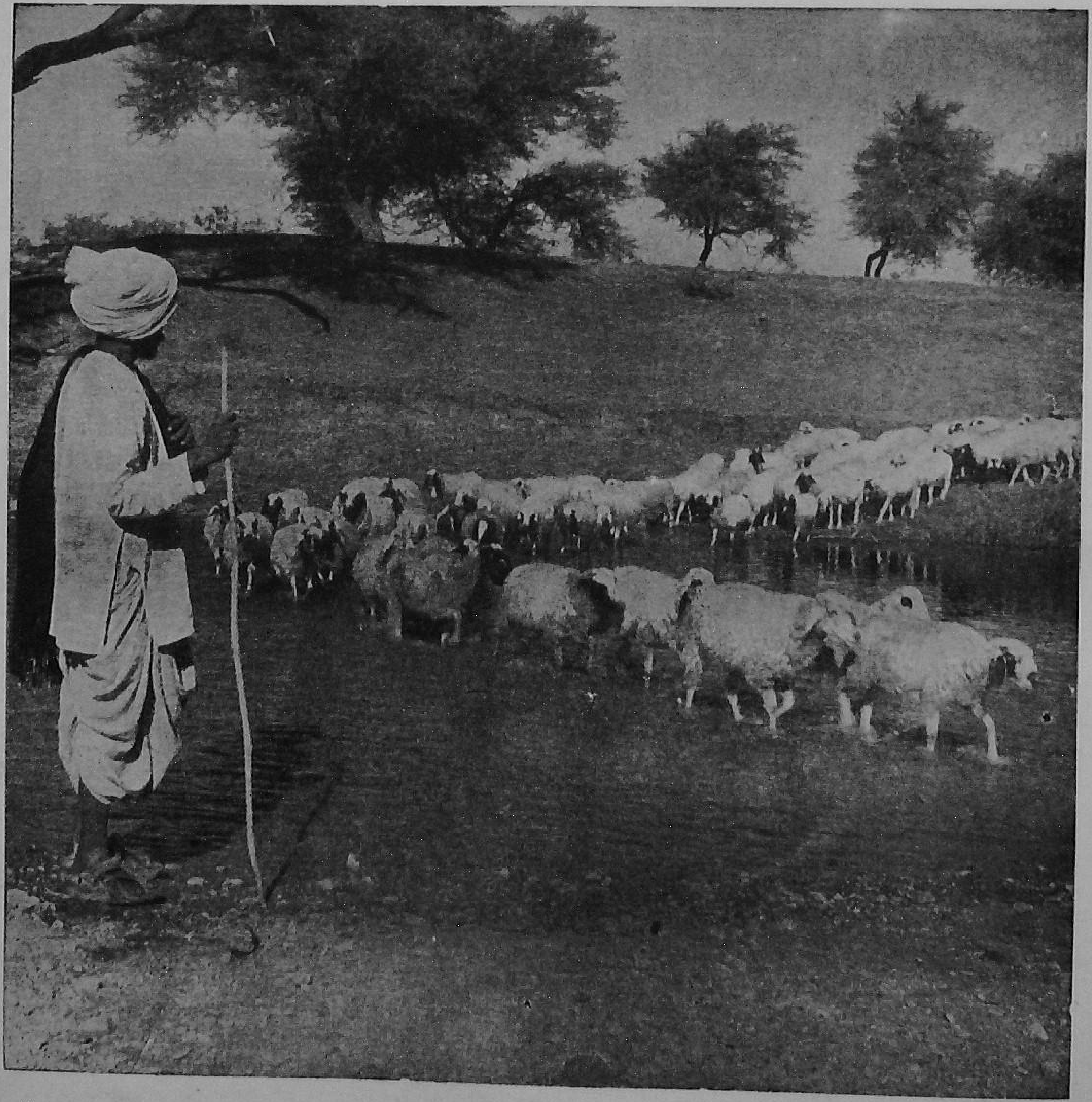
Generally two to three daily waterings are enough for your horse in the cold season. But during the hot weather and when it is in work, supply water four times a day.

Do not give water to your horse for atleast an hour after feeding. Allow it to drink freely while it is at work or even when it is sweating. A horse, even when it is hot, may be given water immediately but should be kept moving until it cools down.

Allow ample time for your horse to drink its fill. Do not take it away from water the first time it raises its head.

Provide water troughs placed at a convenient height so that your horse may not paw over the rim. If you are giving the water in a trough or a pail, see that it has no sharp angles or corners.

Look after the water needs of your farm animals particularly during the summer, and your animals will always be in good shape.



TRY VENEER GRAFTING IN MANGO

S. K. MUKHERJEE and P. K. MAJUMDAR

VENEER grafting is a good method of propagating the mango. The method, it is found, gives as good results as inarching, but does not have its drawbacks.

Inarching, the popular propagation method with mango growers, involves much care and cost, though it is quite simple and effective.

In inarching, you have to bring the seedlings near the mother plants for grafting. If the trees are very tall, the seedling-pots are to be placed on a platform specially built for the purpose and also to be watered regularly. Then again the budded plants take a longer time to grow, and our growers prefer plants of a good height for planting in the fields.

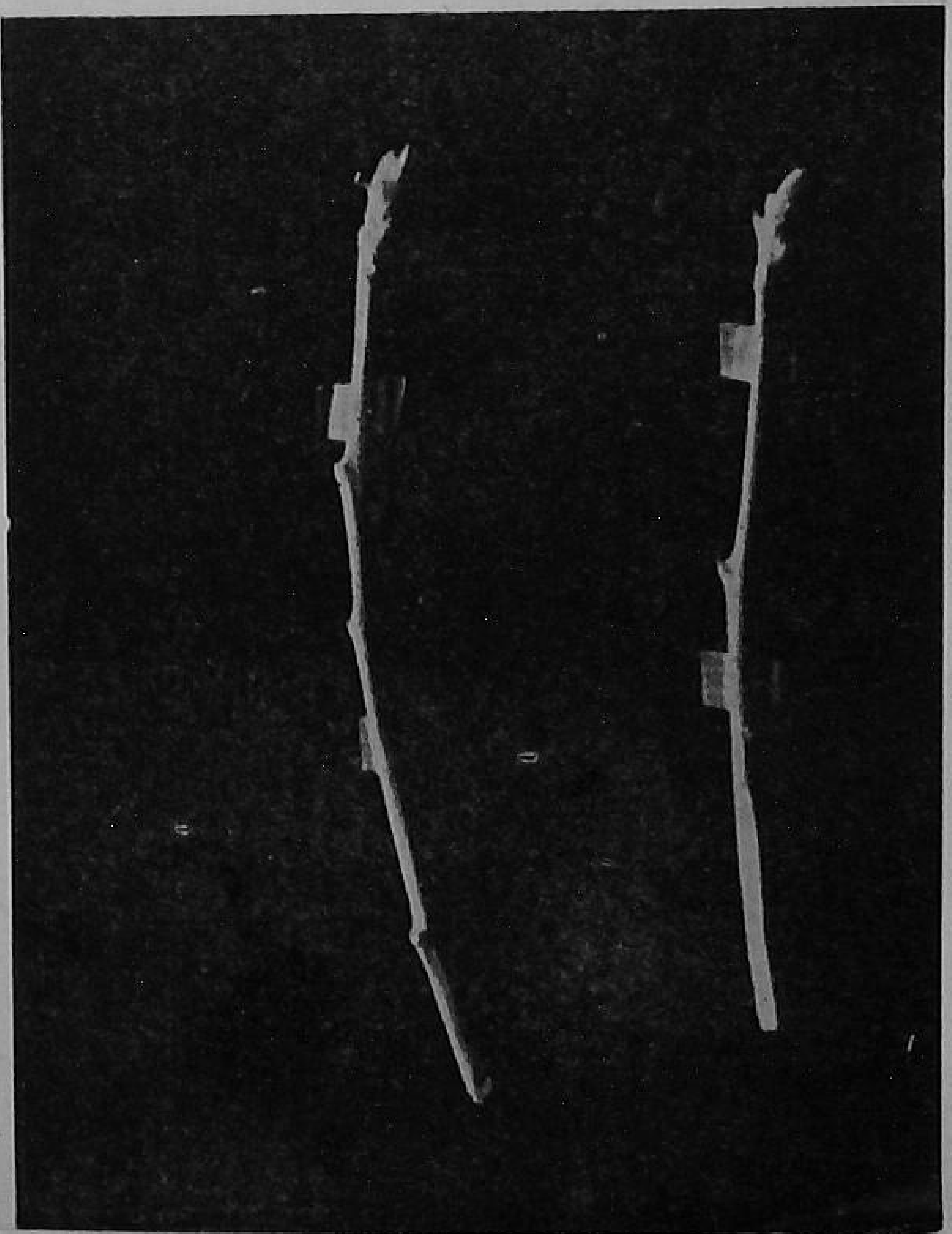
They tried veneer grafting instead at the Horticultural Research Station, Krishnanagar, West Bengal. The method was also tried at the Indian Agricultural Research Institute in New Delhi on such mango varieties as *Langra*, *Dusehri* and *Chousa*. With this method, they got a 70 to 80 per cent success.

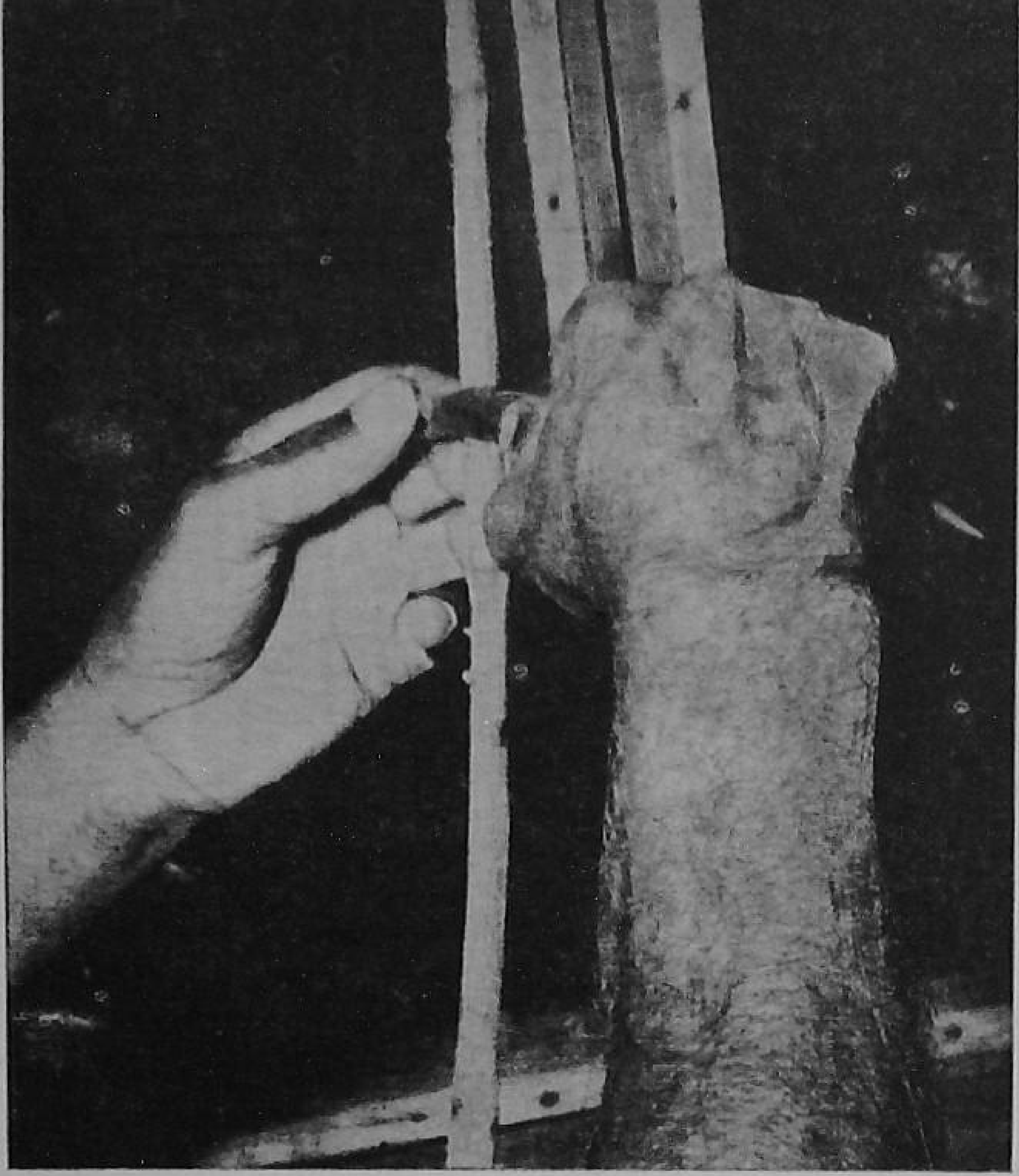
This is how you graft by the veneer method :

Select the scion stick very carefully. The scion stick should be a terminal shoot of four to six inches length and of pencil thickness. Select a terminal bud that will sprout in 10 to 15 days. Such shoots are ideal.

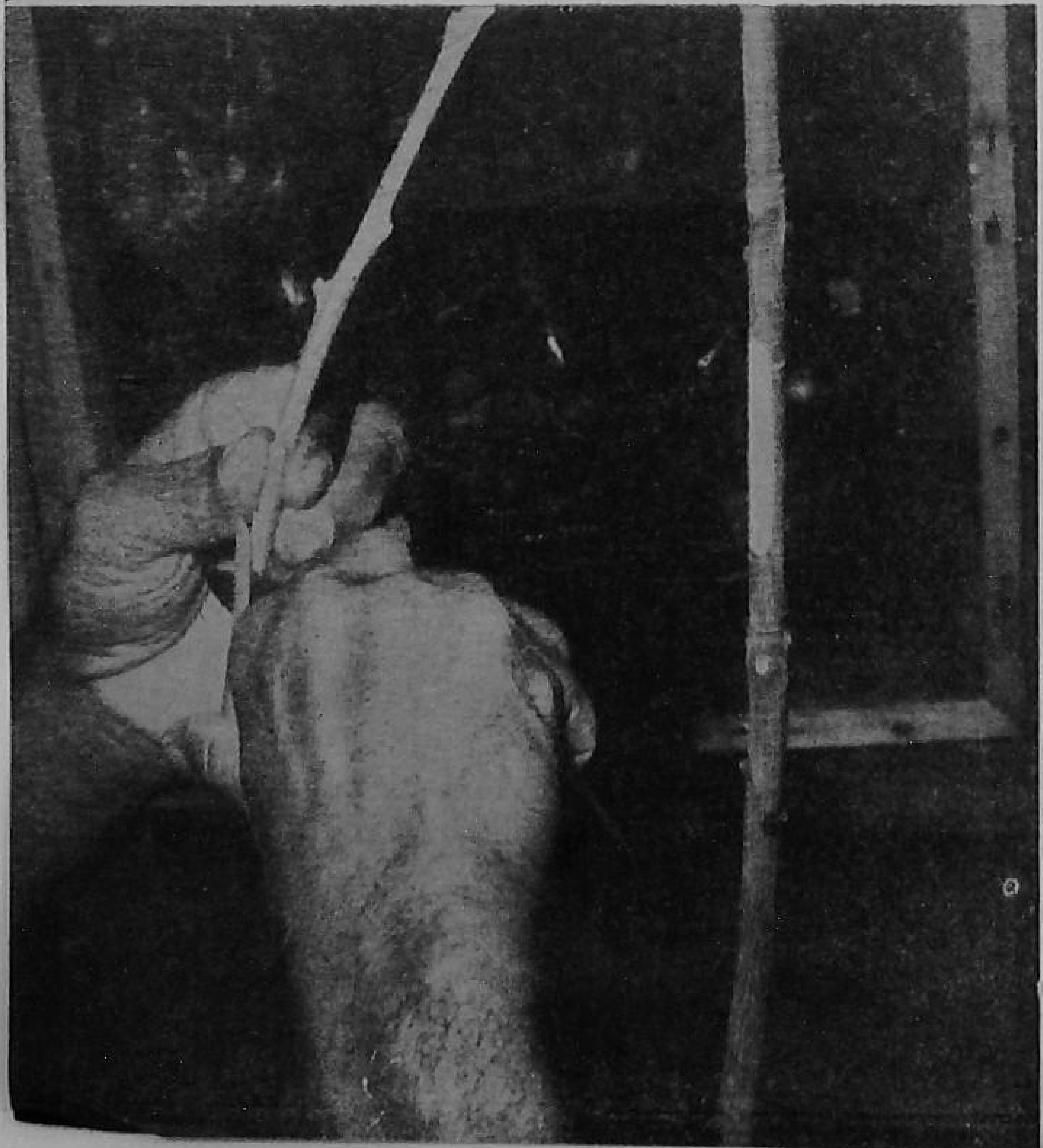
Remove the leaves from the top of the scion about one or two weeks before grafting.

You can do veneer grafting on 1 to 1½ year-old seedling stocks ½ an inch to 2½ inches in diameter. The colour of the bark will vary from greenish pink to green.

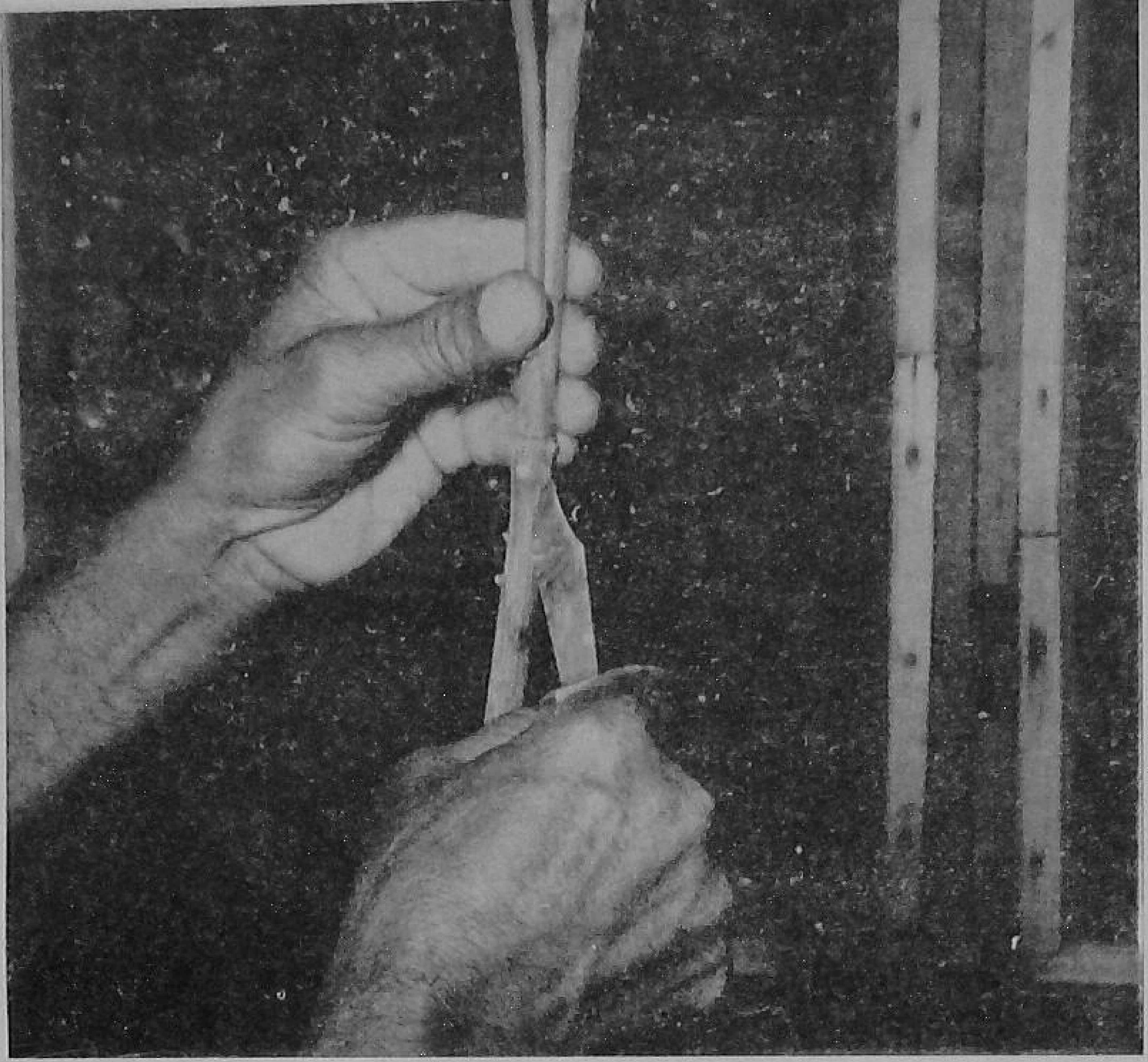




After selecting the scion stick, make a slanting cut about two inches long on one side of the stock stem.



Next, make a slanting cut on one side of the scion which will just fit in with the notch of the stock.

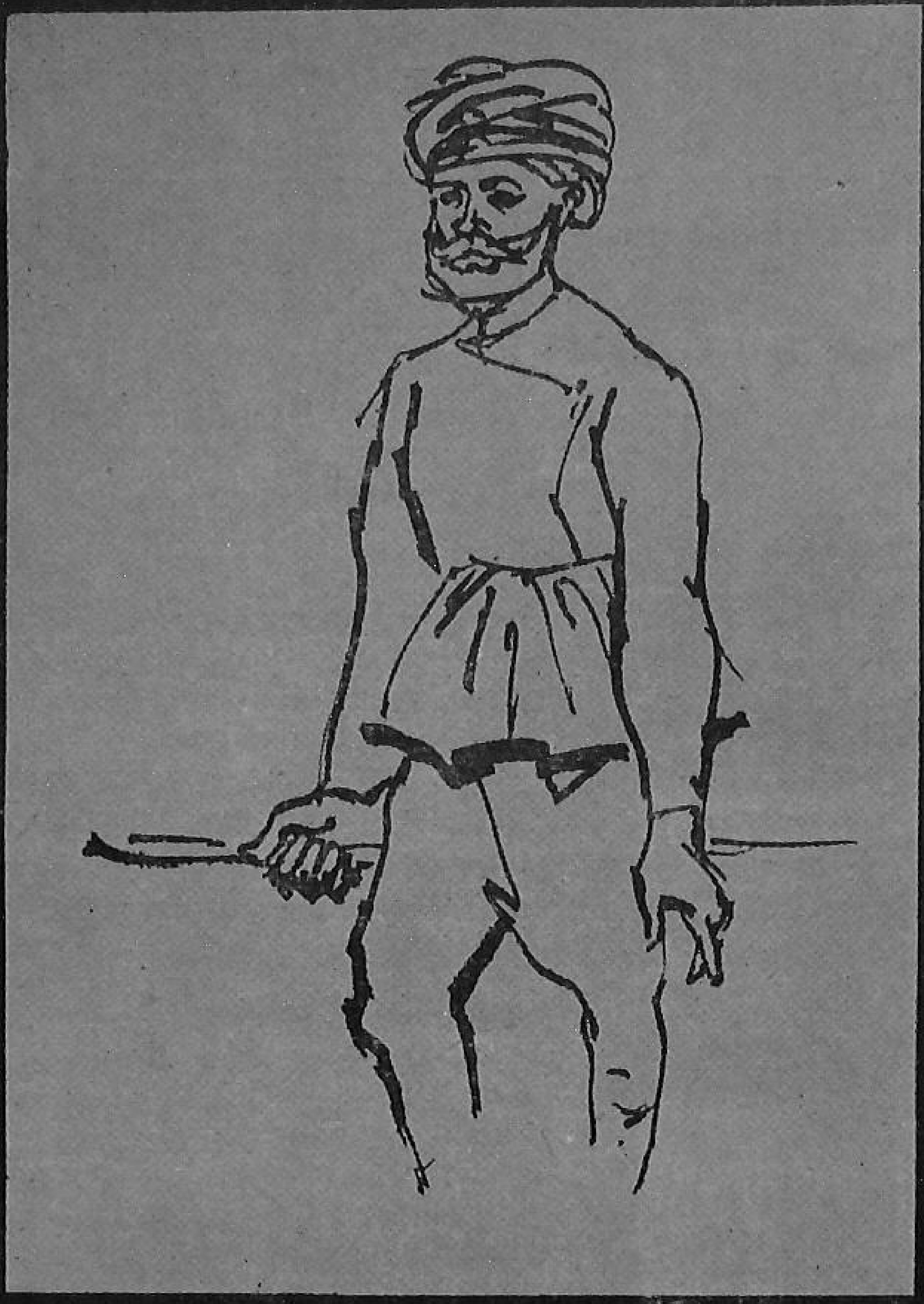


Place the scion in such a position so that the cambiums of both the stock and scion come in close contact.

Wrap it tightly with half an inch wide tape of 200 to 300 gauge alkathene film, keeping the terminal ends free.

When the scion begins to protrude at the top (after about 3 weeks), remove the upper part of the stock; buds will thus grow more rapidly. Remove the plastic wrapper after about two to three months.

Nurserymen can easily take to this method as it has many advantages. You have to use only the scion sticks from the mother plants for propagation and so you need to look after only a small area. By this method you can also propagate a large number of selected varieties, both grafted and seedling, found in different parts of the country.



The Gujrat farmers'

FERTILIZER GUIDE

The Gujarat farmers must be keen to know *what* fertilizers to use, *how* to use them and *when* to use for good crop yields. Here is a general recommendation that they will find profitable. Of course it will be necessary to slightly modify these to suit one's own crop and soil needs. For that the Gram Sevak may be consulted.

Soil Type	*per acre* N (Nitrogen) lb.	P_2O_5 (Phosphoric acid) lb.	K_2O (Potash) lb.	*Time and method of application*
		Paddy (drilled)		
Medium	20	10	—	Half N and full P_2O_5 to be applied at the time of sowing. Remaining N to be applied after four weeks.
		Paddy (transplanted)		
Medium & Heavy	40	20	—	

Soil Type	per acre N (Nitrogen) lb.	P_2O_5 (Phosphoric acid) lb.	K_2O (Potash) lb.	Time and methods of application
		Wheat (Rainfed)		
Sandy & Medium	10	—	—	To be drilled at the time of sowing.
		Wheat (Irrigated)		
Sandy & Medium	40	20	—	Half N and full P_2O_5 to be applied at sowing ; remaining N to be dressed after 4 to 6 weeks of sowing.
		Bajra* and *Jowar		
Light	10	—	—	To be applied at sowing.
Medium	20	—	—	
		Cotton (Rainfed)		
Medium & Heavy	20	10	—	P_2O_5 to be applied at sowing. Half N at sowing or one month after sowing and remaining half two months after sowing.
do	40	20	—	
		Groundnut and Pulses		
Light & Medium	10	20	—	To be applied at sowing.
		Maize		
Light & Medium	20	—	—	do
		Sugarcane		
Medium & heavy	150	75	—	P_2O_5 to be applied 4 to 6 inches deep at planting. N to be applied in four doses; first at planting, second, 6 to 8 weeks after planting, third, 12 to 16 weeks after planting, and fourth, at the time of earthing up.
		Tobacco		
Light & Medium	150	40	—	Half N and full P_2O_5 at transplanting and other half of N one month after transplanting.
		Potato (On Riverbed)		
Sandy	70	70	70	Before planting.
		Vegetables		
	40	20	20	Full P_2O_5 at sowing or transplanting and remaining N and K_2O one month later.
	80	40	40	

TICK FEVER IN POULTRY IS SOMETHING YOU HAVE TO WATCH

By S. G. IYER

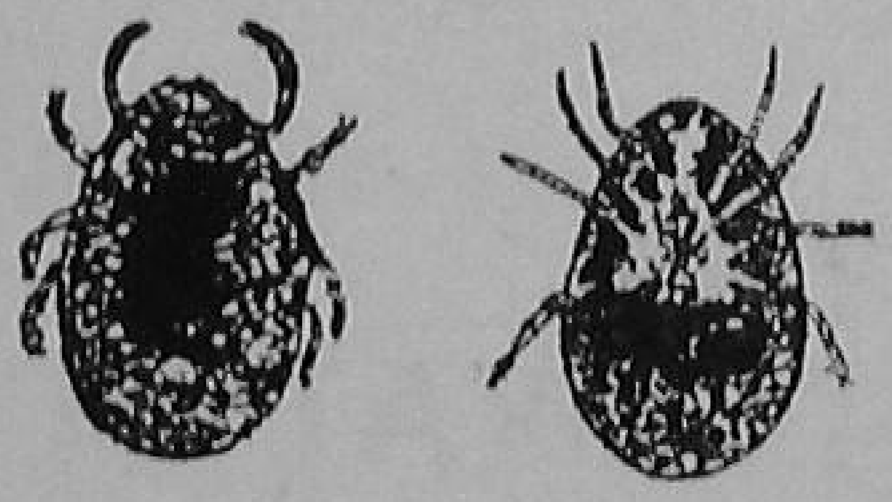
EVERY poultryman sooner or later learns what tick fever or Spirochaetosis can mean in poultry losses. This fever is one of the commonest and the most fatal of poultry diseases in India. In south India the disease is not so common, but in most other parts of the country, it carries off very large number of birds every year.

You can recognise the disease by high fever, loss of power in the legs and the general weakness and diarrhoea in your poultry. Young birds get it more easily than older birds, and imported birds are more likely to get it than our local stock.

The disease is caused by a thread-like, spiral-shaped blood parasite, put into the bird by the bite of the common poultry tick. Apart from direct bites, fowls may pick up the disease by eating ticks or their eggs, or by swallowing foods mixed up with the droppings of infected birds.

The grown-up female tick lays her eggs in cracks and crevices of poultry houses, and the young ticks hatch out in about fifteen days in warm weather. These are very active, but do not suck blood for three to four days. On the fourth day they may be seen sticking to the fowls near the base of the wings and the under surface of the neck where they remain and suck blood for four to nine days. Thereafter they drop off and hide themselves in dark places, and moult in a week's time, come out, and again start sucking blood, fall off the host and moult again. After a further period of feeding and rest, they become adults.

The adult tick only attacks fowls at night, and is usually not noticed during the day, as it hides in holes and crevices in the poultry house. As the tick is small in its early stages, and it hides during the day when fully grown, even when present in large numbers it passes unnoticed. If you suspect ticks, search for them at night on your birds and also on the approaches to the perches.


(L) A Tick ; (R) The same upside down

The period of incubation of the disease is from five to nine days. Tick fever lasts from three to five days, and in a chronic form even up to 21 days. Affected birds will be found shy of their fellows, standing about depressed and with the feathers ruffled. One of the earliest symptoms is swelling of the feet and claws. The fowl rapidly becomes weaker and weaker and the temperature rises to 110°-111°F. The comb and wattles turn pale. Plenty of loose greenish droppings are also seen. The bird is unable to perch thereafter and you will see paralysis in its legs, wings and neck muscles. Finally, the bird will be seen lying with its wings spread out on the ground and its head twisted backwards. In an acute case, the bird dies in convulsions.

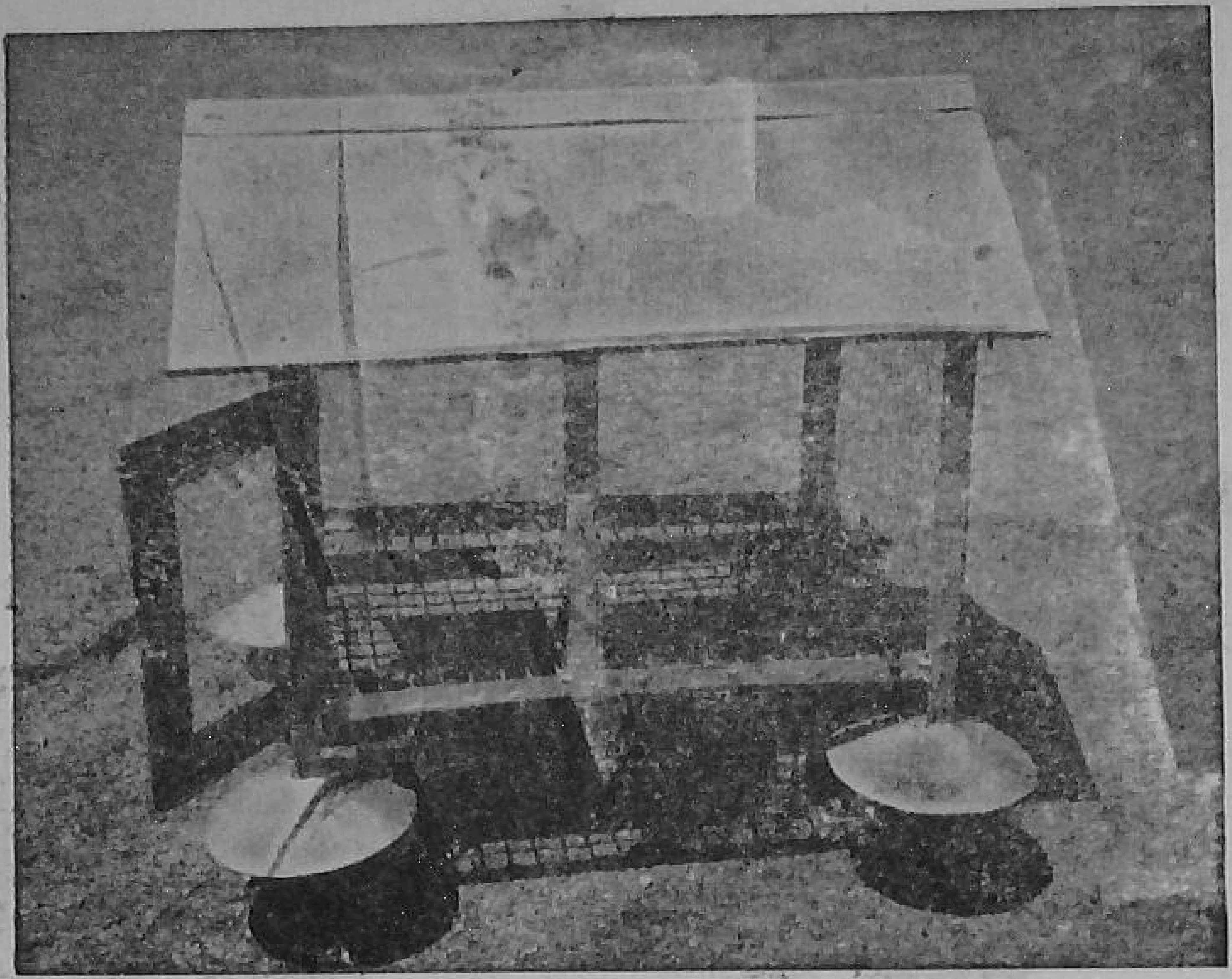
When the disease is severe, 90 per cent of the birds may die.

A bird that dies of the disease starts rotting rapidly. When cut open, its blood will be found thin and watery, the spleen often purple and four to five times the normal size. The liver is also enlarged and congested, and full of small whitish spots. The inner lining of the intestine is usually much swollen and flecked with blood.

If you suspect trouble from ticks in your flock, you should get in touch with your veterinary doctor. He will be able to say for certain that the disease is tick fever if you send him samples of blood taken during the height of the fever.

Ticks can only produce tick fever if they themselves are infected. But even healthy ticks can be a source of trouble, if present in large numbers, as they suck blood out of the birds. Even in such cases, death from loss of blood is not uncommon, especially in young birds.

The first step in treating birds for tick fever is to get help in diagnosing the disease. However, if ticks are present and losses are heavy, take immediate steps to get rid of the ticks. This is no easy matter if the houses have been badly made, as ticks in such places hide deep in crevices and it is difficult to kill them. If the house is of metal, you can make a good fire of waste straw or hay in the house and then kill the ticks. In well-built brick houses, use a blow-lamp freely and follow up by a thorough spraying with kerosene under pressure, if possible. Paint wooden houses and equipment with kerosene or creosote. Treating mud houses is very difficult, and it is better that you destroy such houses, making it a point to remove the birds during the day time to new houses.



Ticks can have no access to such a poultry house made of angle-iron and fitted with metallic cups to their legs

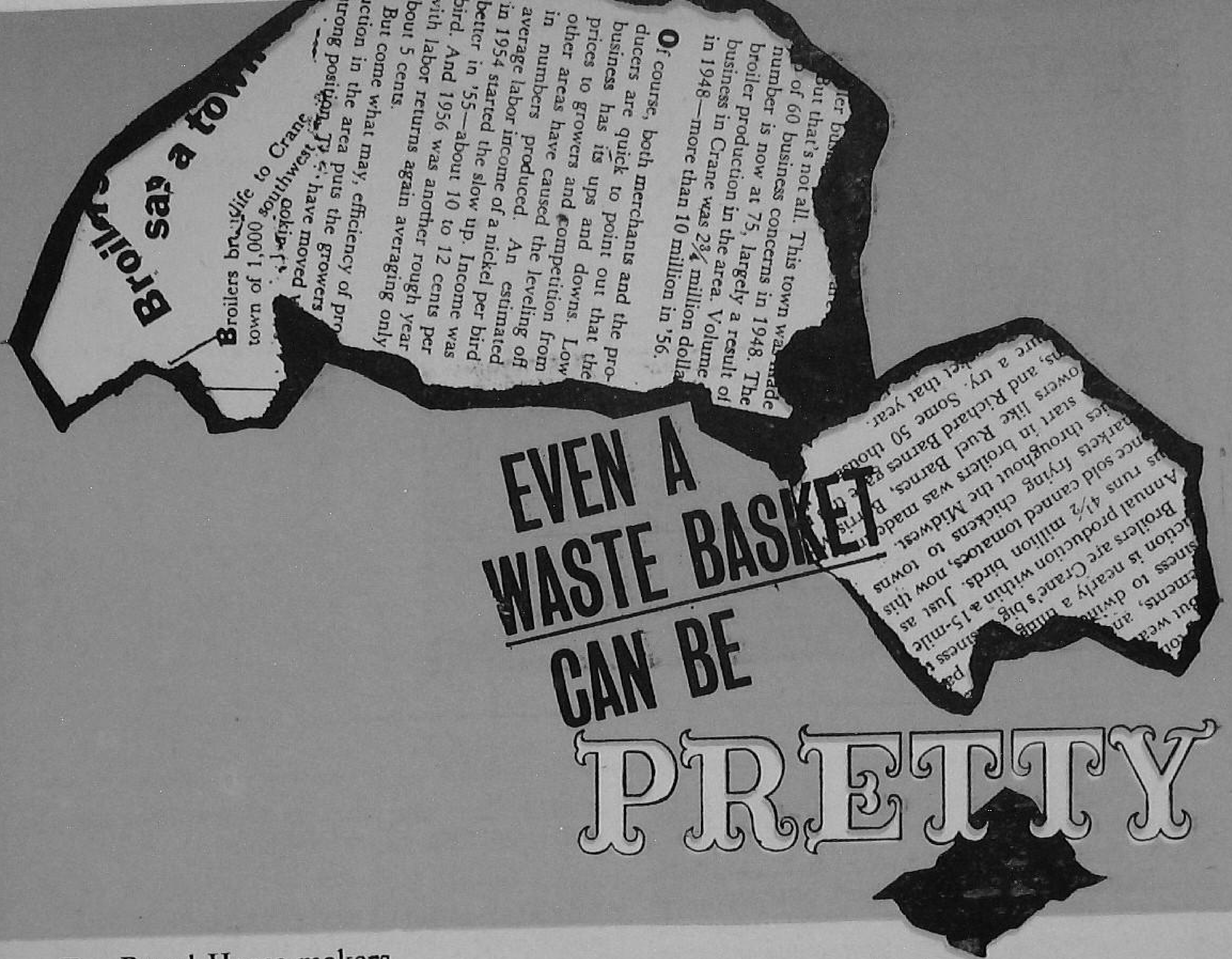
Treat affected birds without delay. Inject penicillin procain in doses of 15,000 to 20,000 units. Sulpharsenol is also a valuable preparation, for use during an outbreak. A dose of 200 mg. per kg. body weight in 2 cc distilled water by intramuscular injection is a safe dose for the birds. This way, birds will get a life-long immunity to the disease. Once the fever goes down, no drug will help.

As in other diseases, in tick fever prevention is better than cure. Fowls can get infected during railway transit. To prevent the disease being introduced by newly purchased birds, isolate them for a period of 10 days in a coop, and watch for ticks on them. Thoroughly disinfect the crate in which the birds are received. Better still, destroy such crates.

If you are a beginner in poultry, start with new houses on clean soil. The safest type of house is one made of angle iron, and covered with wire netting. The safest method of obtaining new stock is to purchase eggs and hatch them in an incubator.

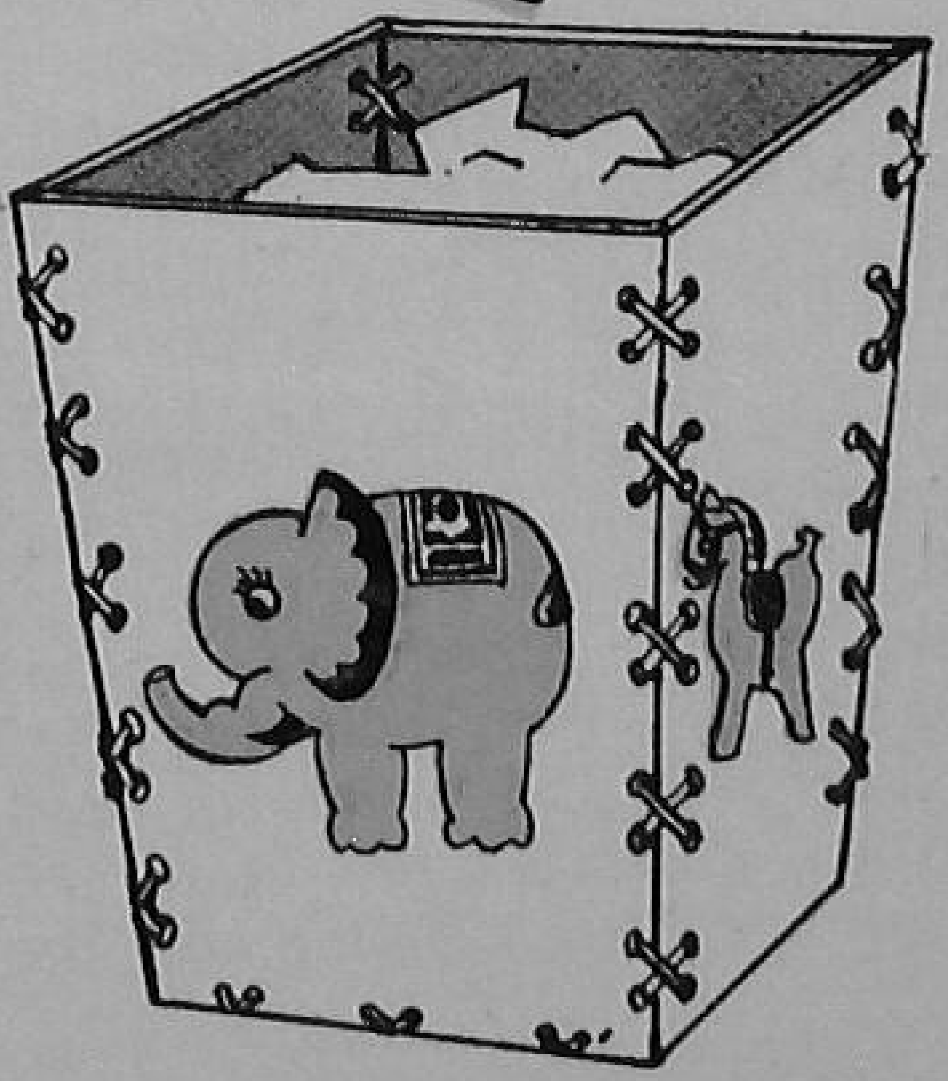
Houses can be made tick-proof by making a cement channel all around the house and keeping it filled with water. Take care, however, to see that no gaps are left in this barrier. If you fail to replace the water when required, or bridge the gap in any way, infection may be the result.

You can prevent ticks from attacking the fowls by providing tick-proof perches in poultry houses. You can easily do this by fitting a metallic cup on each of the vertical supports of the perches, and filling these cups with water and a thin coat of kerosene. Renew the water and kerosene whenever necessary. Take care to see that the perches are kept well away from the walls. If the ticks can crawl up these, they are sure to get on to the fowls. Another way to keep perches free from ticks is to suspend the perches from the roof by means of wires.



EVEN A WASTE BASKET CAN BE PRETTY

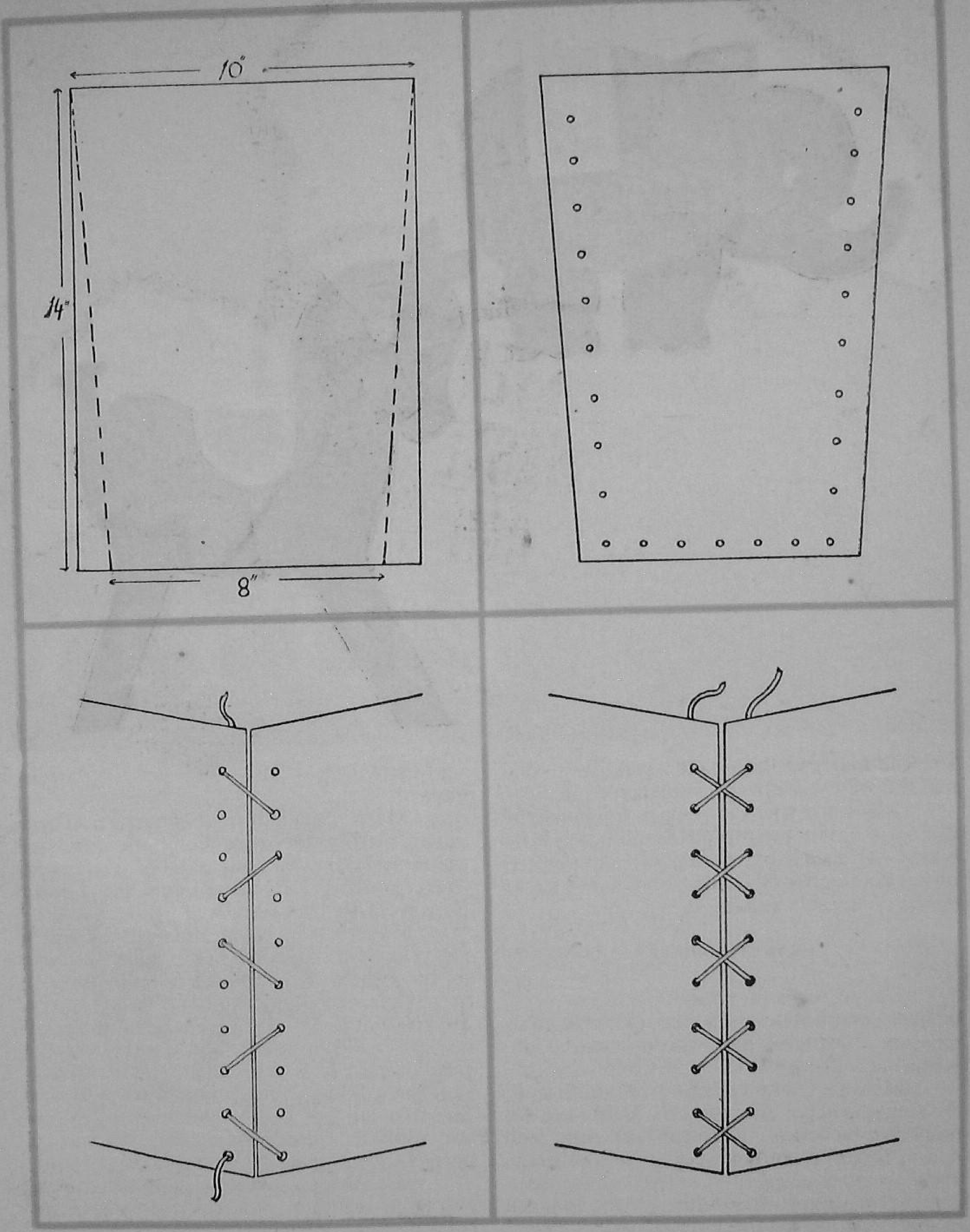
For Rural Home-makers



By KAMLESH PURI

HOW often have you wondered what to do when your children and some times even the grown-ups go on throwing titbits and unwanted things here and there in the house ? You can't go on collecting them all over the house all the time, for there will be no end to it. What in fact you should do is to make a few waste baskets and keep them at convenient places in your home. And such baskets can be pretty too.

You will see how fast children pick up the habit of throwing all the refuse into these baskets. And once they start doing this,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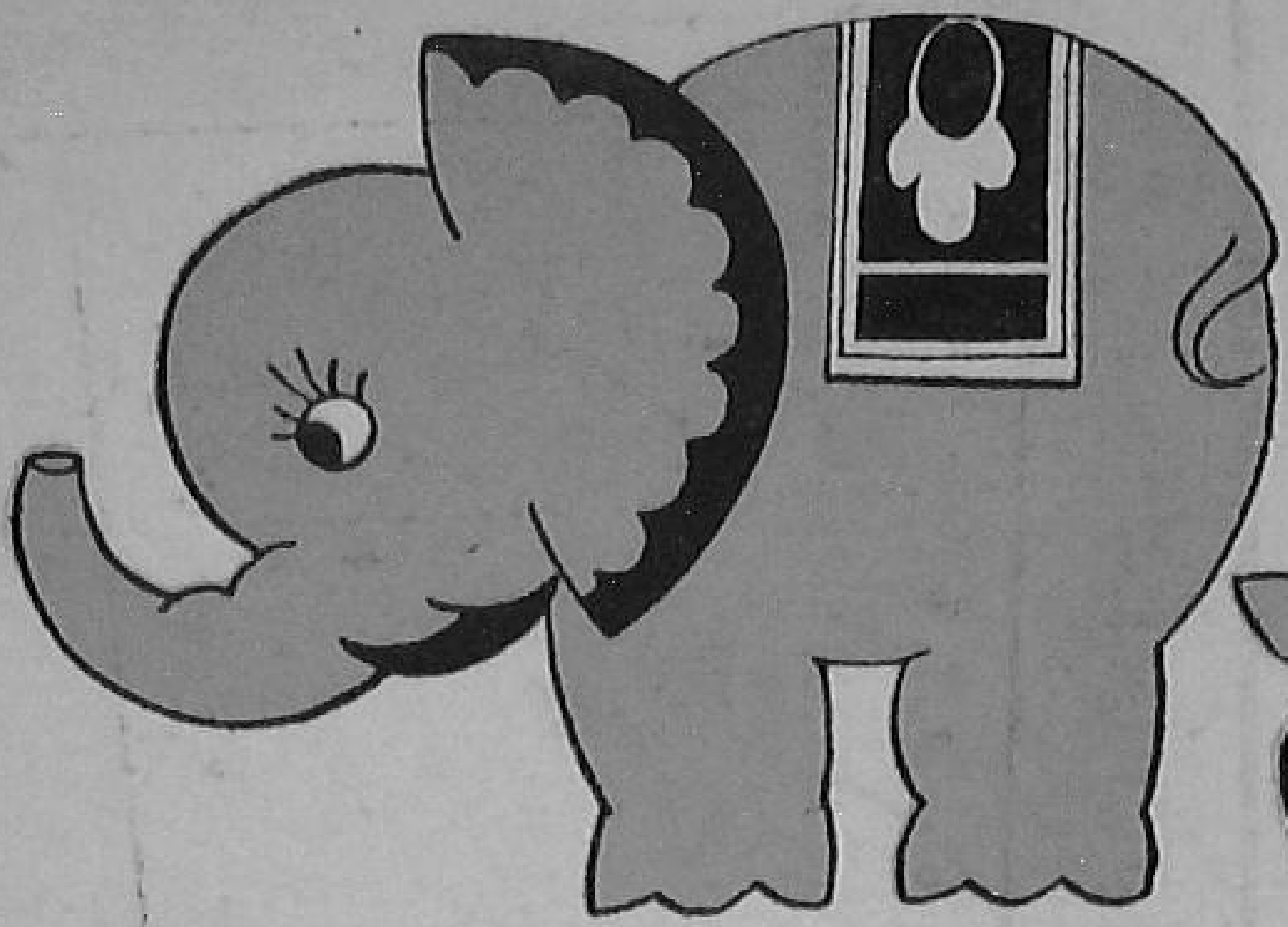
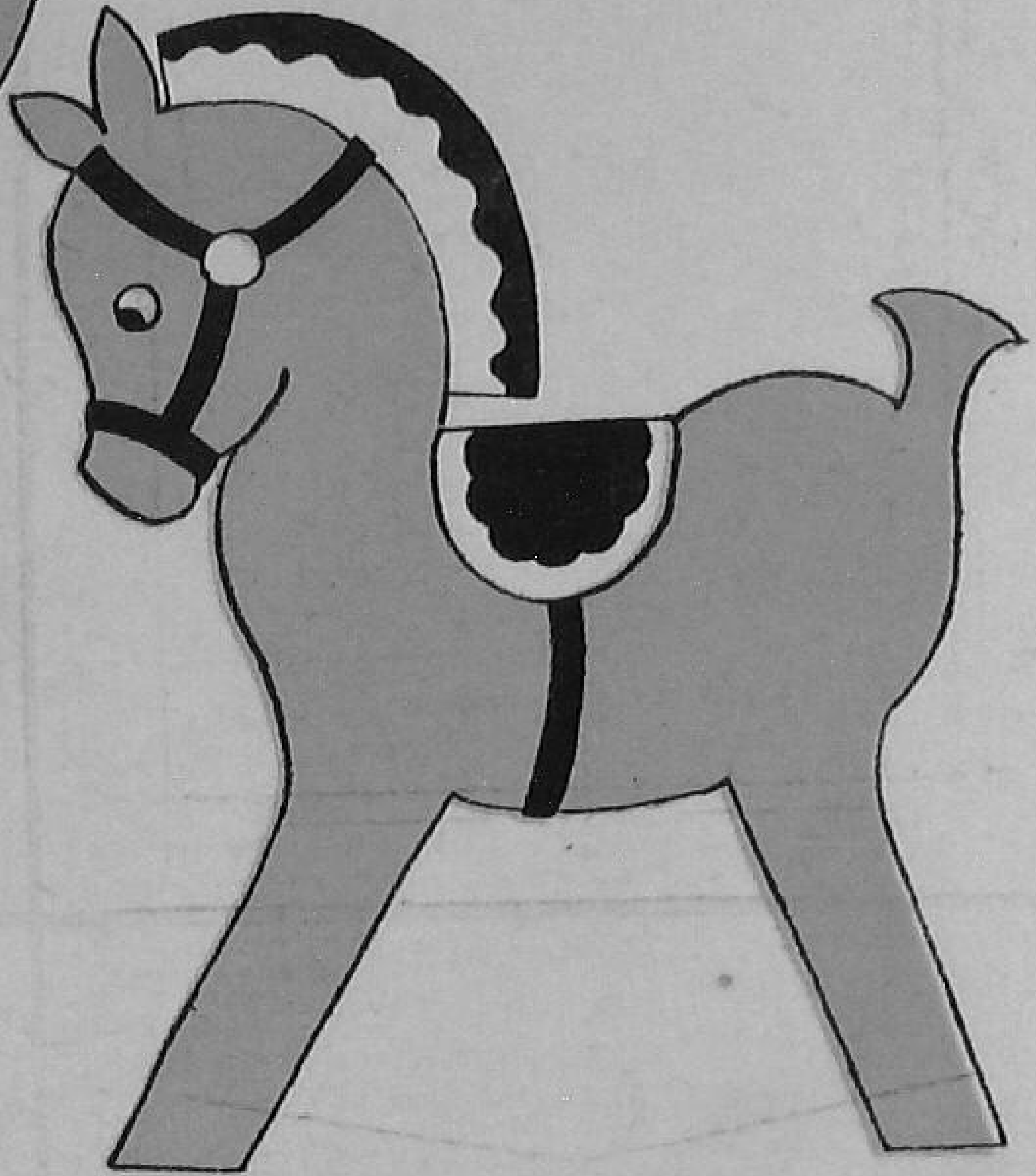
14"
8"





you will find your home all spick and span just the way you always wanted it to be.

Materials you will require for preparing one such basket are pressed wood or plywood board—46 inches by 14 inches, water colours, poster colours or oil colours and some strong lacing of suitable colour.

HOW TO MAKE IT

Fold a piece of paper (14 inches by 10 inches) length-wise. The paper will now measure 14 inches by 5 inches on the left. Keep the fold on the left.

Measure four inches from the bottom of the fold and mark the point as A. Measure a point five inches along the top, call it B. Join A and B with a straight line. Cut along the line.

Next, trace the outline of the pattern on the plywood or the pressed wood board and then cut it. Sand the edges till they are smooth.

Mark dots half inch apart and ¼ inch inwards from the edge along the sides and the lower edges of each side of the basket. Mark similar dots all around the bottom portion of the board as well.

Make holes at these dots, with a drill or any pointed instrument. Better make the holes on the right side. Sand the holes lightly.

Decorate the sides of the basket. You can use motifs or designs for decorating. If you are painting them, apply two coats of clear varnish or white shellac. This will prevent the colours from fading away. But be sure that the first coat of colour is dry before you apply the varnish or shellac. Thread the holes with lacing as shown in the illustration.

Place this basket at a convenient place, and your children will enjoy throwing the rubbish in it.

Regd. No. D-1180

LEAFLETS

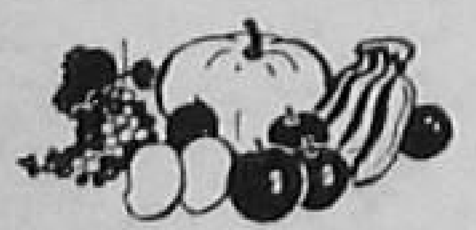
FOR PROGRESSIVE FARMERS

FARMING

Treating seed before sowing
Protect your soil
Better implements for a better rice crop
How to treat paddy seed
Better level and bund your field
Raise a better barley crop
Getting good gram yields
The way to higher wheat yields
Late blight of potatoes
How to make silage
Choose your irrigation method
Better grow berseem
How to make paddy straw a better cattle feed
Grow maize the improved way
Five fodder grasses that you can grow

MANURES AND FERTILIZERS

Compost is easy to prepare
Green manuring
How to use fertilizers
Facts obout fertilizers
Water hyacinth gives a good compost
Giant Hemp is a good green manure crop



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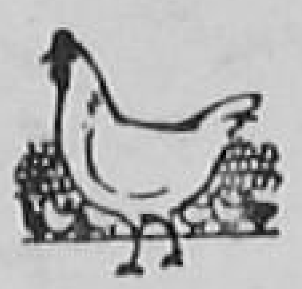
Papaya is easy to grow
Drumstick—the year-round vegetable
Growing grapes in south India
Rabi vegetables—grow them this way
How to grow paying pineapples



POULTRY

How to fight coccidiosis in poultry
Protect your poultry birds against Ranikhet
Save your fowls from tick fever
Fighting fowl pox in poultry
How do you transport your poultry birds ?
Watch out for pullorum
Culling poultry for profit
How to make a brooder for your chicks
How to start a poultry farm
How to control lice on poultry
Tapeworms in poultry
Your chickens and infectious coryza
The egg and you
Making eggs keep fresh
How to pack eggs for transport
Selecting poultry birds for breeding
Selecting birds for poultry show
Moulting in poultry
Poultry keeping for egg production
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EXTENSION

THE FARM AND FARM HOME MAGAZINE June, 1962

THE PICTURE ON THE COVER

Picking tomato calls for closest care. Pick the fruits as soon as they are ready, otherwise ripening of other fruits will be delayed. While picking see that you don't overload your basket lest the fruits get injured. Also, avoid unnecessary trampling of vines. Remember, attractive fruits fetch a better price.

Photo by R. Paul

EXTENSION

THE FARM AND FARM HOME MAGAZINE

Vol. II JUNE, 1962 No. 12

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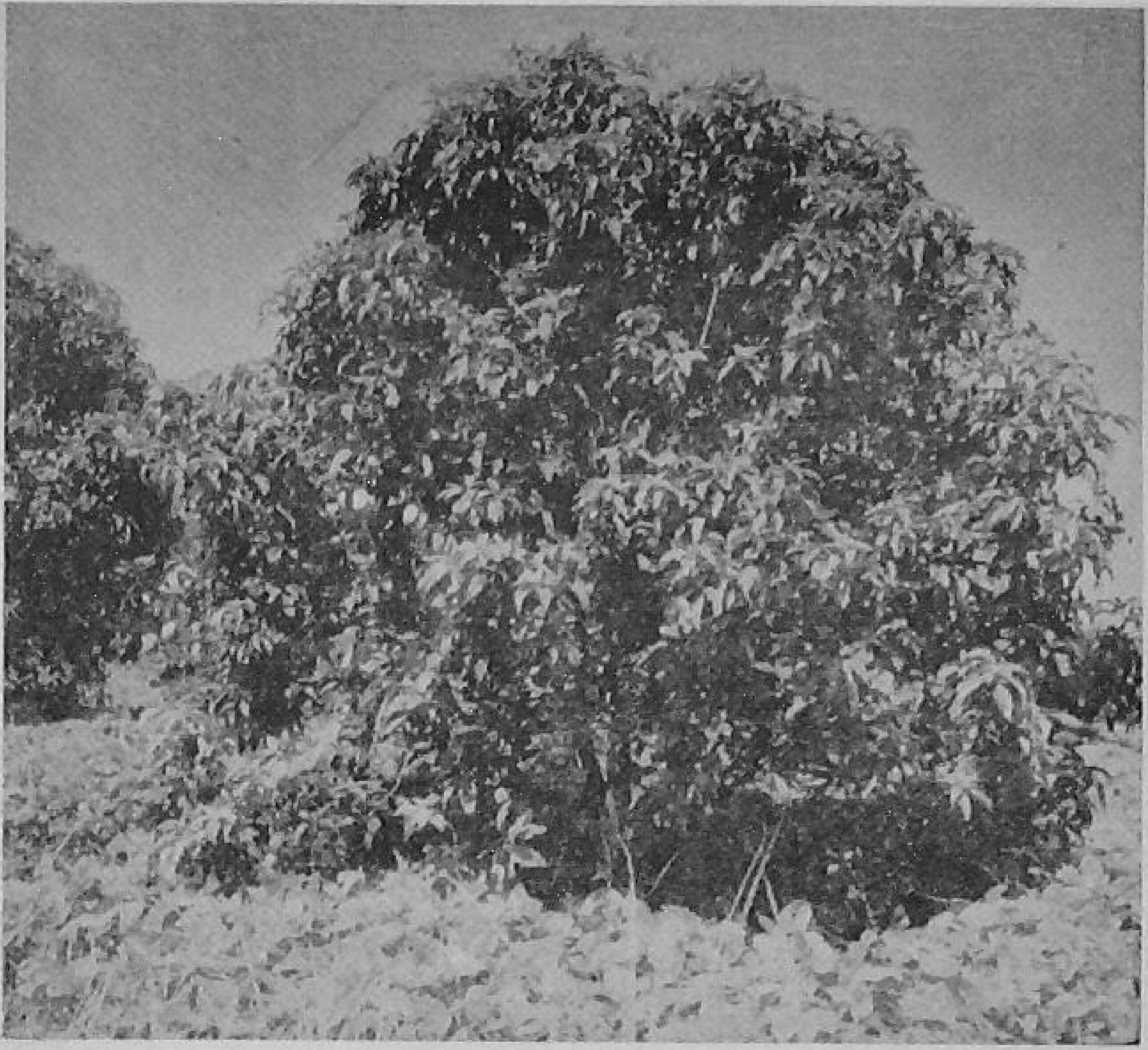
Monsoon task IN MANGO GARDENS



A cover crop grown in the orchard at this time will provide enough green manure for your trees

By L. VENKATARATNAM

THIS monsoon, follow these seven tips to get more mangoes and better mangoes from your garden.

Start irrigating the mango trees every fortnight when the fruits are of the size of *amla*. This will not only reduce fruit drop, but will also help develop good juicy fruits.

Hunt out for the parasite *bundha* (Loranthus) plants which appear on the trees about this time. Cut the affected branches with an axe and remove and burn them.

Spread ten cartloads of cattle manure, compost or tank silt on each acre of your orchard.

Plough the orchard well with the receipt of the first monsoon showers and broadcast seeds of green manure crops like *lobia* and sannhemp. Instead of sannhemp you can sow wild indigo, but then you must soak its seed in boiling water for five minutes before sowing. There is one good thing about wild indigo. Once you raise it, you need not sow it again next year, as it reseeds itself and comes up on its own.

Plough in the green manure crop in September. Apply two hundredweights of superphosphate and four hundredweights of potassium sulphate per acre. This dose of course is for a full-bearing mango plantation.

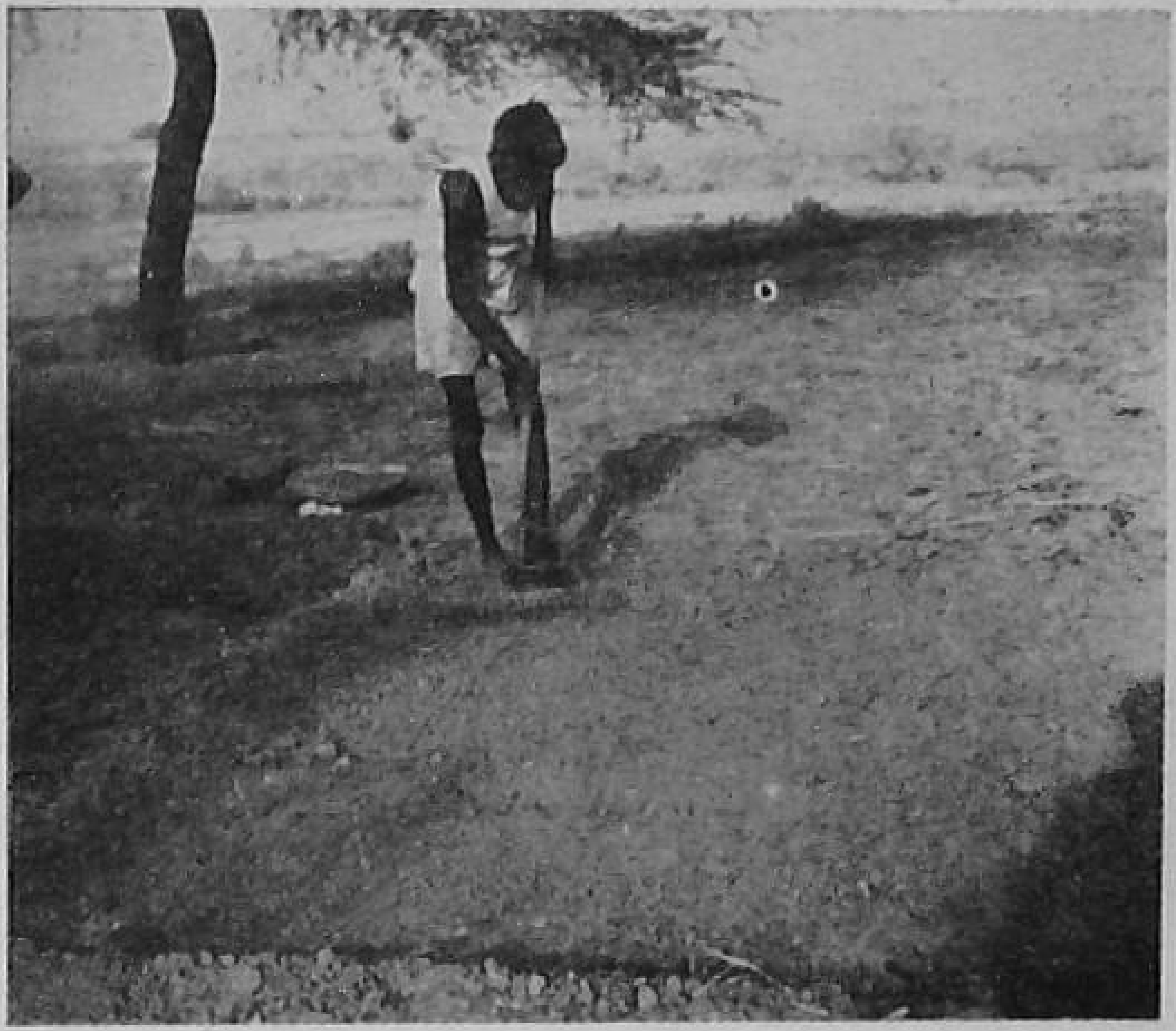
Provide shade to young plants with grass thatching or dry *arhar* stalks.

Raise a shelter belt around the plantation to protect the fruits from sun-burn and hot winds. If you don't have a shelter belt, sow *jantar* or *sewri* around the plantation and along the main irrigation channel, and especially on the southern and western sides, as more hot winds blow from these directions.

BETTER CAULIFLOWER SEEDLINGS THIS WAY

By N. B. MULWANI and L. VENKATARATNAM

RAISE your cauliflower seedlings the following way, and see how healthy and vigorous they grow in a short time. The earlier the seedlings are ready, the earlier you can catch the market and the better the price you can get for your produce. Besides, by following this method you will be saving on seed too.

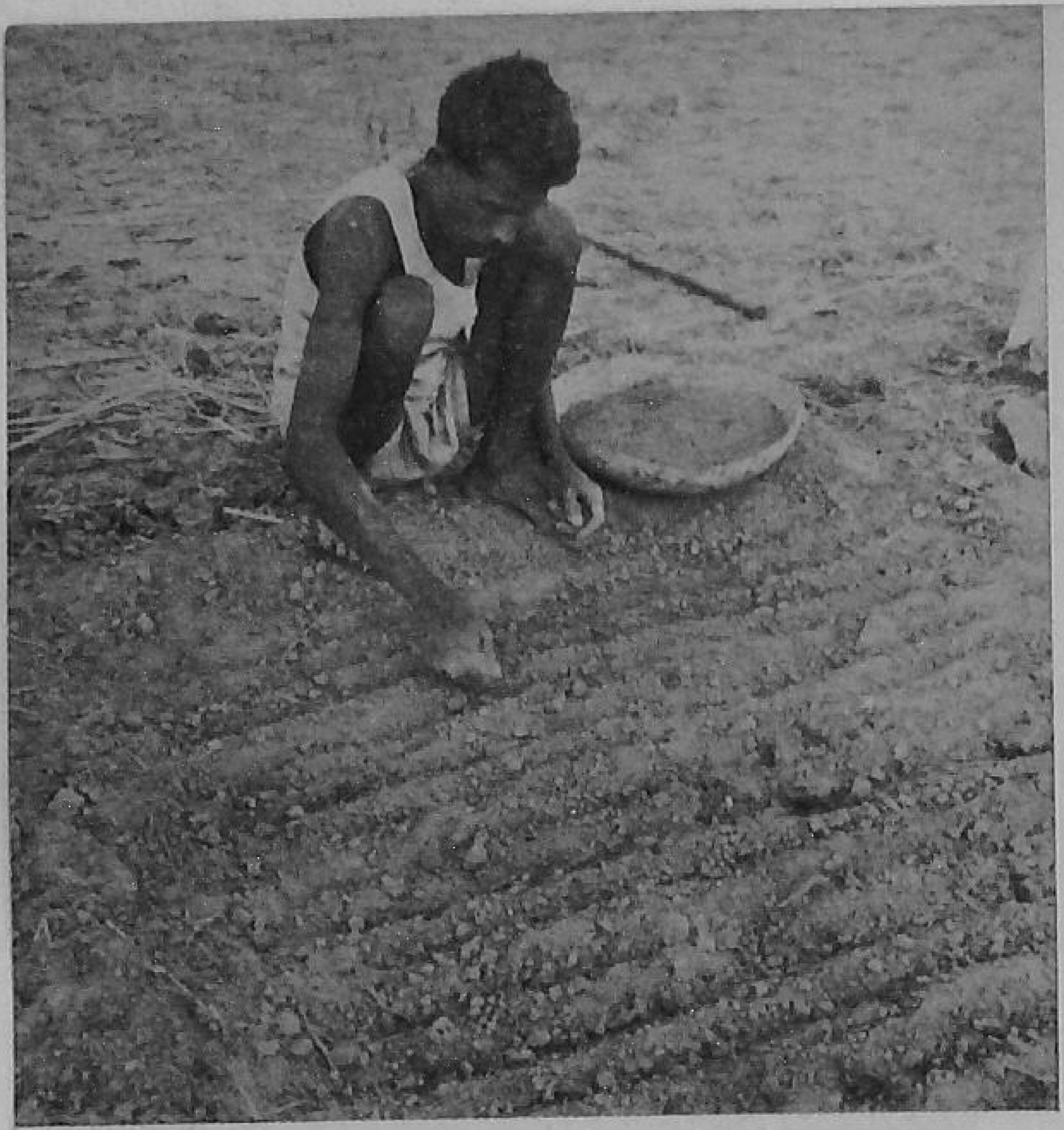


Prepare the seed-bed well

- Select a patch of land 24 feet by 12 feet close to a well. Dig the area a foot deep or plough thrice and remove all weeds. Pulverise the soil thoroughly.

Treat the seed with 'Agrosan G. N.' before sowing

- Spread 2 cartloads (40 maunds) of well-rotted powdered farmyard manure or sieved compost and mix thoroughly. Level the plot. Divide the area into eight plots of eight feet by five feet keeping a one-foot wide and nine inches deep channel for irrigation and for draining out water during rains.



Sow the seed in lines

• Draw lines 3 inches apart and one-third inch deep in the beds.

• Take eight ounces of 'Patna Early' or 'Pusa Katki' seed in a piece of thick cloth. Mix one basket of ash and a pinch of 'Agrosan G.N.' (1 part for 500 parts of seed) with it by shaking. Pour the mixture in a basket.

• Sow in lines. Cover the seed gently with the help of a wooden plank or by hand.

• Provide shade to the seed-bed with straw thatching or *sirki*. If

Cover the seed with earth after sowing

Provide shade for the seedlings

Seedlings ready for transplanting

shade is not provided for raising early cualiflower seedlings, they will take two more weeks to become ready for transplanting. Shading promotes quick growth and saves time.

• Apply water gently just to soak the beds upto four inches. Do not flood them. Irrigate at an interval of five to seven days, but only when the first half an inch of soil dries up.

• In four week's time one inch high healthy seedlings with three to four leaves can be lifted and transplanted. Seedlings from these eight beds will be sufficient to plant an acre.

MAKE THE FERTILIZER WORK FOR YOUR RICE

By M. V. VACHHANI

THERE is a way of making the fertilizer you apply to rice give much better results than it normally does.

Most of our rice farmers use ammonium sulphate for their rice crop at 100 to 150 pounds per acre. This much fertilizer increases the grain yield by 300 to 500 pounds per acre. Most of them apply this fertilizer in one dose. This way, much of the nitrogen in fertilizer is lost, and the rice plants do not fully make use of what is available.

To get the best results from the fertilizer, apply ammonium sulphate in two or three doses (two for a short-duration crop and three for a long-duration one). Apply the first at planting, the second a month later,

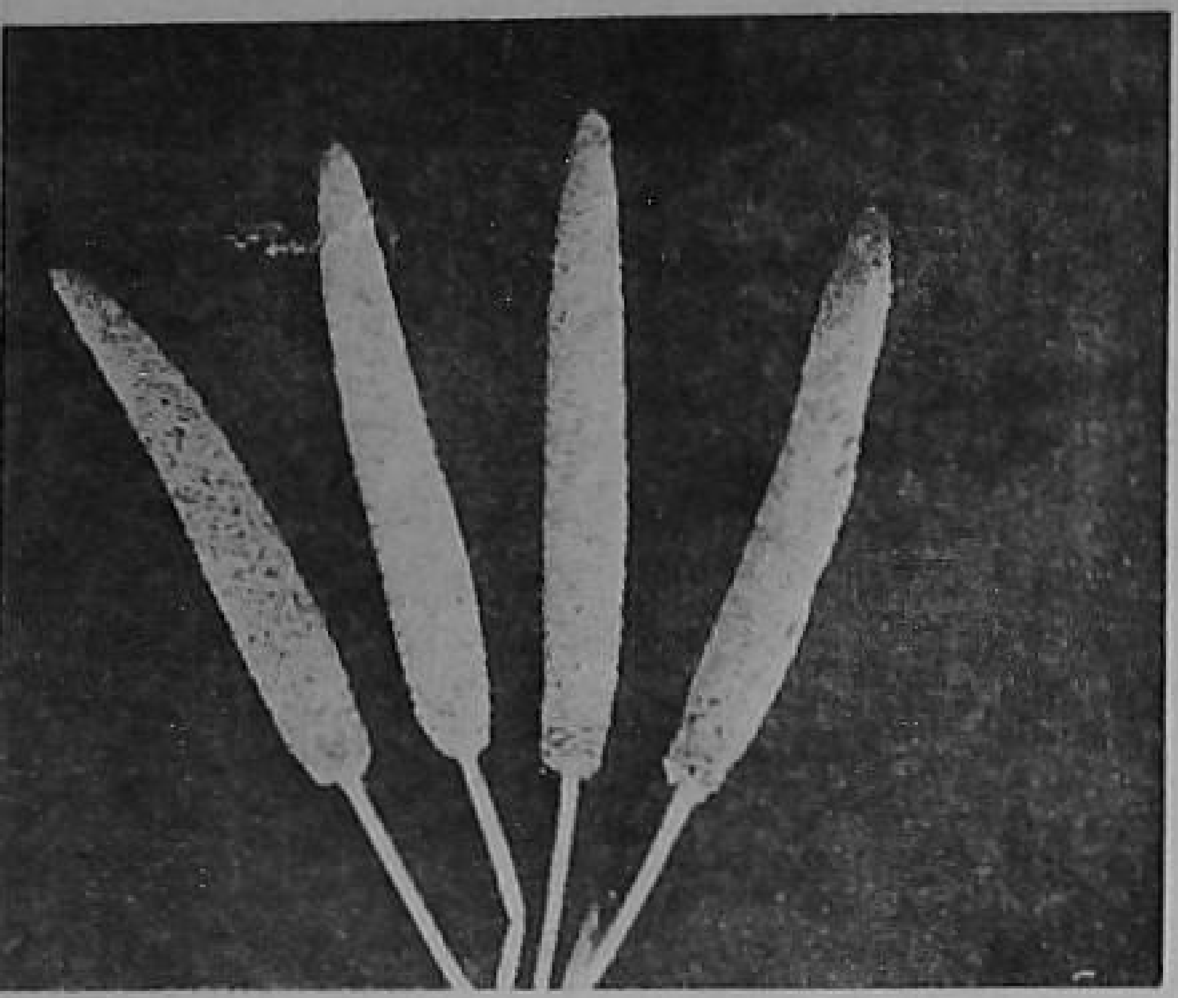
and the third two to three weeks before flowering starts. This way, nitrogen is available to the plants when they can use it best during their active growth periods.

Many farmers apply the fertilizer as a top-dressing by spreading it on the soil surface. To get more yield, the fertilizer should be placed two to three inches under the soil surface. This you do by applying it to the field just before puddling, and then mixing it thoroughly with the soil. This is for the basal dose. For the second and third doses, make balls of the fertilizer by mixing it with soil (in the proportion of 1:10) and moistening it. Press these balls down near the roots of the plants.

If you are using a Japanese paddy weeder, then spread the fertilizer between rows and work the implement so that the fertilizer is thoroughly mixed with the soil.

This way, one hundred pounds of fertilizer will give as good results as 200 pounds of it just applied on the surface of the soil.

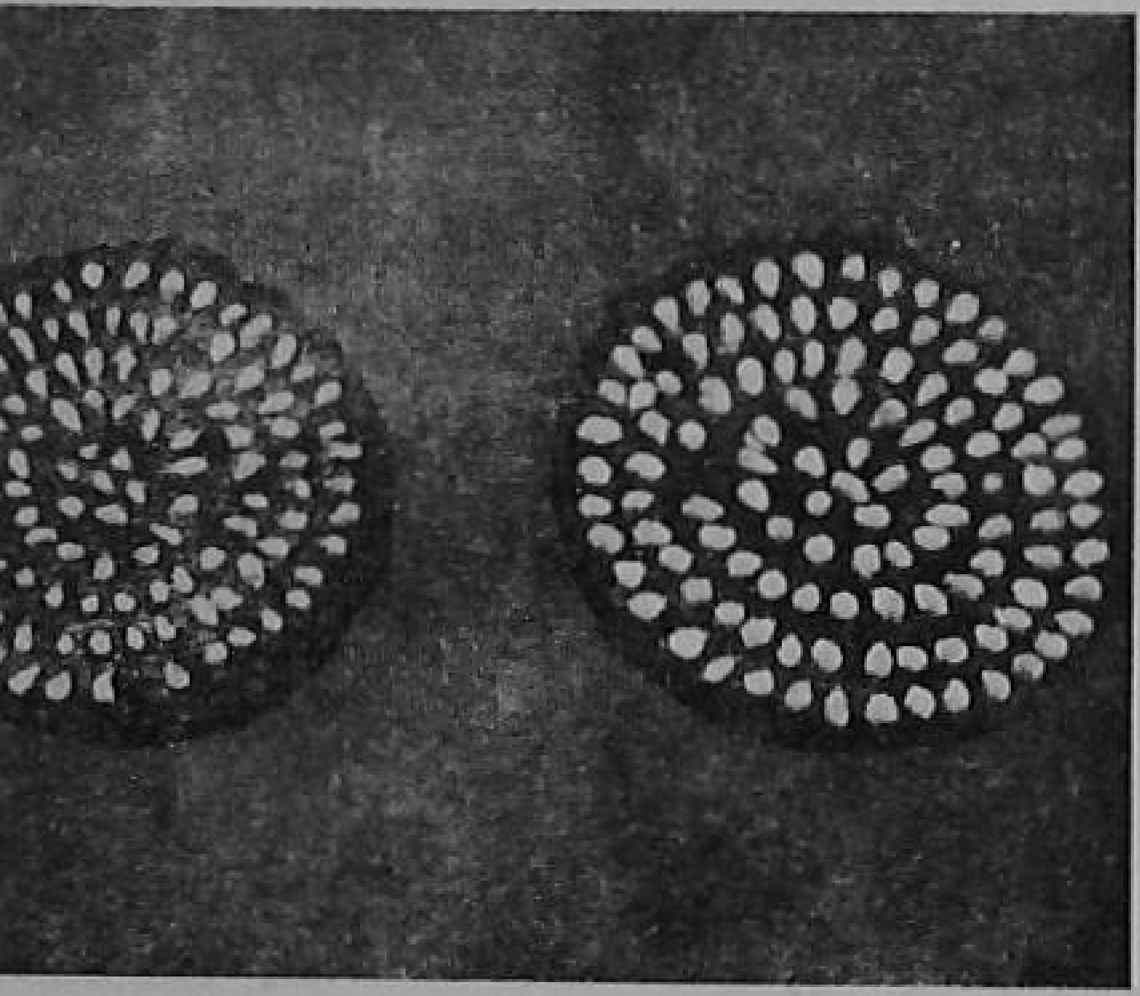
The fertilizer is being mixed with the soil after it has been spread in-between the crop rows



Matured cobs of 'Improved Ghana'

By A. R. KHAN and B. S. JOON

'IMPROVED GHANA' IMPRESSES FARMERS



rains from T. 55 (L) and Ghana (R) ; the
ld size and heavy weight of grains make
the difference between the old and the
new variety

A *bajra* variety, newly tried in the Delhi area, has impressed farmers. This *bajra*, which is called 'Improved Ghana,' was evolved by the Indian Agricultural Research Institute, New Delhi.

In the Delhi area, farmers grow *bajra* in 48,000 acres. It is an important *kharif* crop to the Delhi farmers. Like the adjoining areas of Rajasthan and south-west Punjab, *bajra* is grown here with insufficient and irregular rainfall. But unlike maize, *bajra* survives even on a small amount of rain. Hence, the farmers grow it as a stand-by crop.

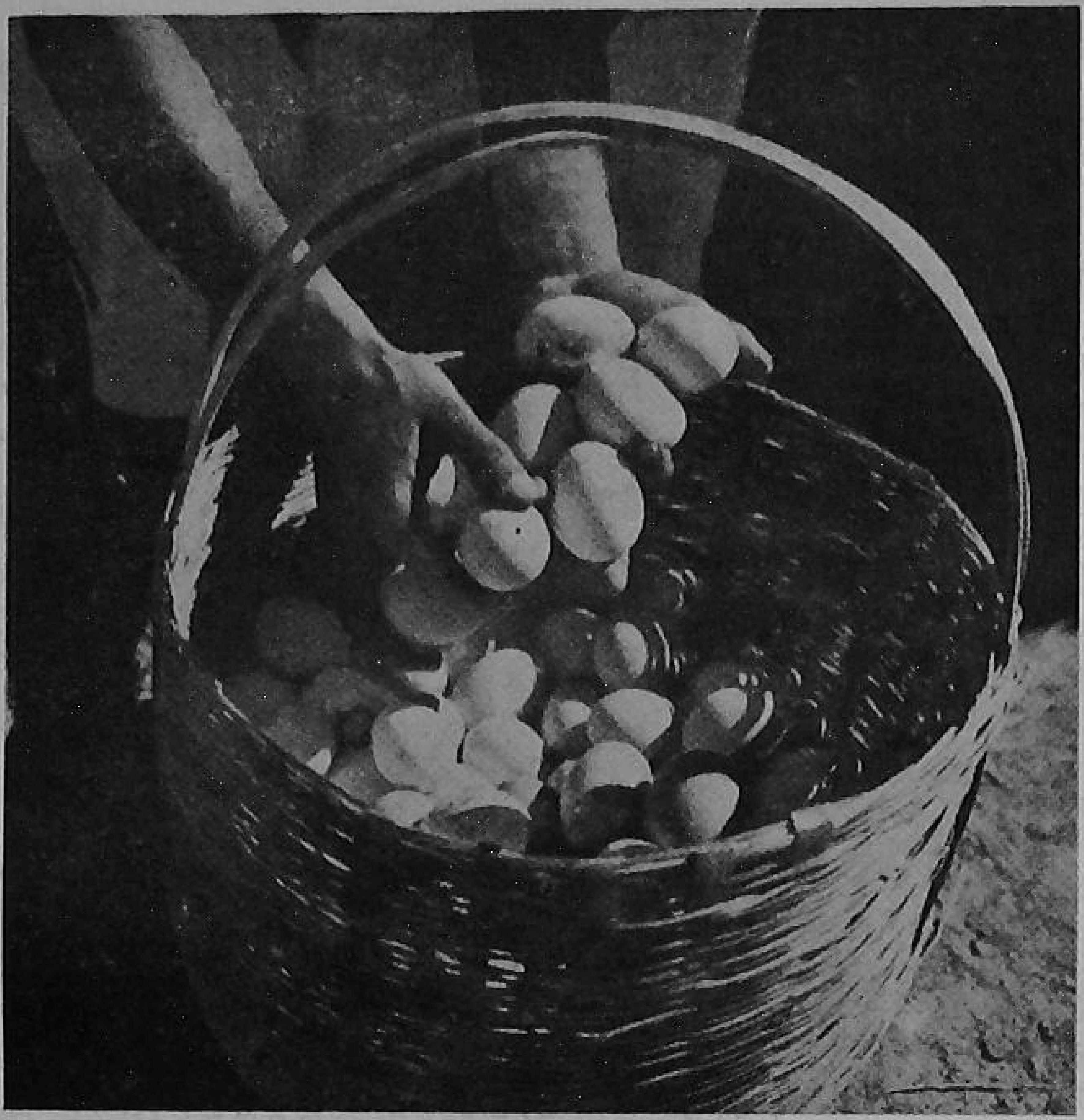
Some years back, a Punjab variety, Type 55, was introduced in this area. This has been a popular variety ever since. However, 'Improved Ghana' is now showing that it can do better than Type 55.

The new variety was selected out of a seed received from Ghana (Africa). The variety is fairly tall, matures early (taking 40 to 45 days to flower and 65 to 70 days to mature). It produces a good head with bold grains. Under rainfed conditions, it gives an average yield of 80 kilograms per acre.

Last *kharif*, this variety was tried in the Kanjhawla Block by the Indian Agricultural Institute, New Delhi. Heavy rains damaged the crop in almost all the places where it was tried. However, in 10 villages, the crop was not very much damaged and here its behaviour was studied. The Ghana variety gave about 23 per cent increase in grain-yield over Type 55.

The crop was not very impressive at the beginning, but as the ears came out, it started showing up. Increase in yield, the farmers found, was due to the bold size and heavier weight of the grains.

In all the villages where this variety was tried, there has been a good demand for its seed. It looks as if 'Improved Ghana' is going to be the future *bajra* variety of this area.



To get more eggs and better eggs you must look after your laying birds well

HOW TO MAKE MORE MONEY WITH YOUR LAYING BIRDS

By S. G. IYER

POULTRY keepers who know how to manage their laying flocks are getting good profits from them. They follow some simple rules as a part of flock management. With these simple rules it should be possible for you to get more money from the birds you keep.

The first rule you should follow is to remove growing chickens, just before they start laying eggs to laying houses. See that your flock is even in size and, if possible, consists of birds from the same batch that was hatched. Never mix young pullets with older birds. If you mix them you will always have to face trouble from worms, lice and ticks.

The most common number of birds in a breeding pen is ten. But in the case of laying birds, you can put 50 to 100 birds per pen.

If you are keeping one breed only, you can have free range for them. Because there is no fence in this system, the birds will pick up worms, grass and fallen grains and thus add to the feed given. Here, you construct the houses far apart, so that too many birds may not collect in any of the houses. If you follow this system, you have to take care of attacks from animals also. The birds may lay eggs away from the house. As such, this system is not very good to follow, especially if your poultry farm is near a city.

The other system is the semi-intensive one. Here, you confine the birds in fenced runs and hence they are well-protected. However, take care not to overcrowd the birds. The safe rule is to keep

200 birds per acre or 20 square yards' space per bird. It is good to have two runs, so that periodically you can shift the birds from one run to the other.

The third system, which is getting more popular today is the intensive one. Here, the birds are confined in permanently built houses all the time, on a layer of deep litter on the floor. It is necessary here to provide the birds with all the feeds they need, including Vitamin D3. In the West, this system is widely followed for what is called broiler production and also for commercial egg production. A floor area of four square feet per bird is provided in this system.

The intensive system saves labour and land, and helps better production and freedom from parasites.

Some poultry keepers keep birds in small cages, each measuring 15 inches by 15 inches by 18 inches. This is known as the battery system. Pullets kept in such batteries for 10 to 12 months are more tender in the flesh and hence fetch a better price in the market. Where land is not easily available, you can follow this system in a small way, if you want to produce your own table eggs.

—Keeping birds in a fenced run is a good practice, provided you do not overcrowd them

HATCHING

The time of hatching is important if you want more profits from the flock. Normally, egg production goes down in September-October; egg prices go up. The low egg production is because of the moulting of the older birds and the young birds not coming into production at the time. If you are a commercial egg producer, you should aim to get the maximum number of eggs during this period, so that you can get high prices.

The birds which are hatched from November to February, start laying quickly and through the summer and early autumn. It will be good to arrange hatching on various dates, so that a good number of birds come to lay during the low egg production period.

MANAGEMENT

Keep these rules in mind in managing your laying flock.

Provide a balanced ration for the birds to eat as much as they like and plenty of good water to drink.

Examine the birds from time to time for lice, picks and other parasites. The moment you notice any of these, do not lose time in treating the birds. Separate out all ailing birds from the flock. Where you suspect infectious diseases, carefully examine the suspected birds and destroy them. Action at the right time will save endless trouble later.

BROODY BIRDS

Remove broody birds as early as you can. With many broody birds in a flock egg production will drop.

Broodiness is not a problem in light breeds like the Leghorn. But in heavy breeds like the Rhode Island or Australorp, many of the laying birds go broody.

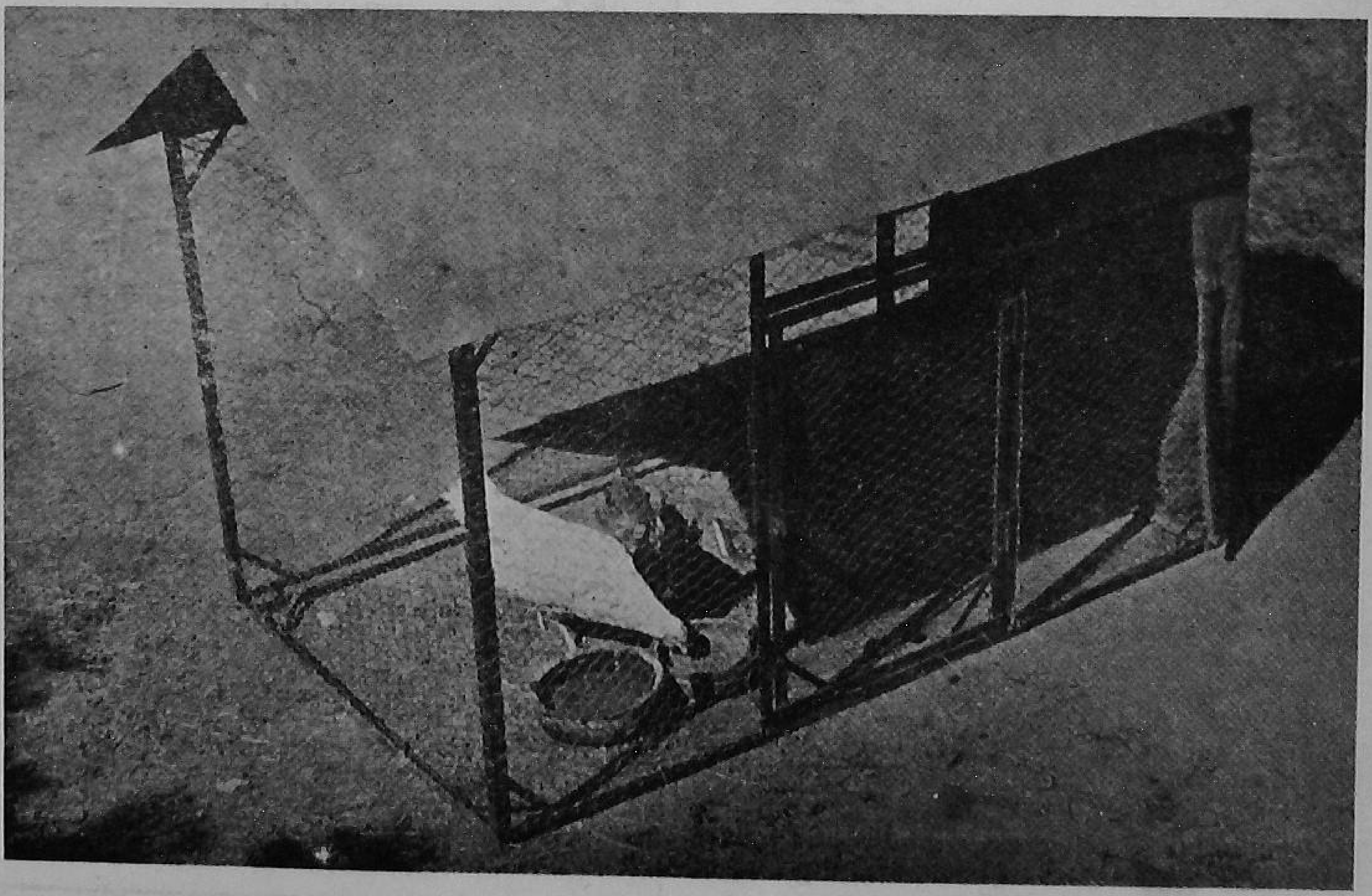
There is a way of bringing broody birds into production. Detect the broody birds early and put them in a broody coop or cage with wire or slatted floor so built as to prevent the birds nesting. In a week's time, the birds are cured of their broodiness. When they are in the cage, keep them well-supplied with food and water. After a week, transfer them back to their laying house.

Good birds come back into laying in 10 to 14 days from the time they start broodiness. Attack from parasites or allowing eggs to lie in the nests for long periods encourage broodiness. Houses and nests should be kept as cool as possible as hot weather encourages broodiness.

NESTS

To get clean eggs, provide enough nesting space for the birds. Such a nest should be fairly built, cool and well-ventilated and easy to clean. Provide a space of 15-inch square per nest. It should also be deep so that the eggs do not roll out.

If you have less space, you can rear the birds in cages ; but see that you provide all the food they need



Vaccinating the birds in time is one of the important rules in management practices

Most birds lay between 9 and 12 in the forenoon. Hence, it is good to provide one nest for every three laying birds. The nests should be also portable so that you can easily clean and disinfect them. Clean them once a year. Do not expose the nests to direct sun so that the birds may not get heat stroke. Also examine the nests for lice and ticks. Keep D.D.T. and B.H.C. powder handy for dusting if you notice any of these.

BIRDS IN MOULT

Poor layers moult their feathers early and slowly and take a long time to come into production. Good layers, on the other hand, moult rapidly and come back quickly into production. Birds, as a rule, moult five times during their growing period and after that once a year. In layers, moulting occurs after 10 to 12 months of laying.

We welcome your

QUESTIONS and SUGGESTIONS

Address them to

EDITOR

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Ministry of Food and Agriculture
Krishi Bhavan

NEW DELHI

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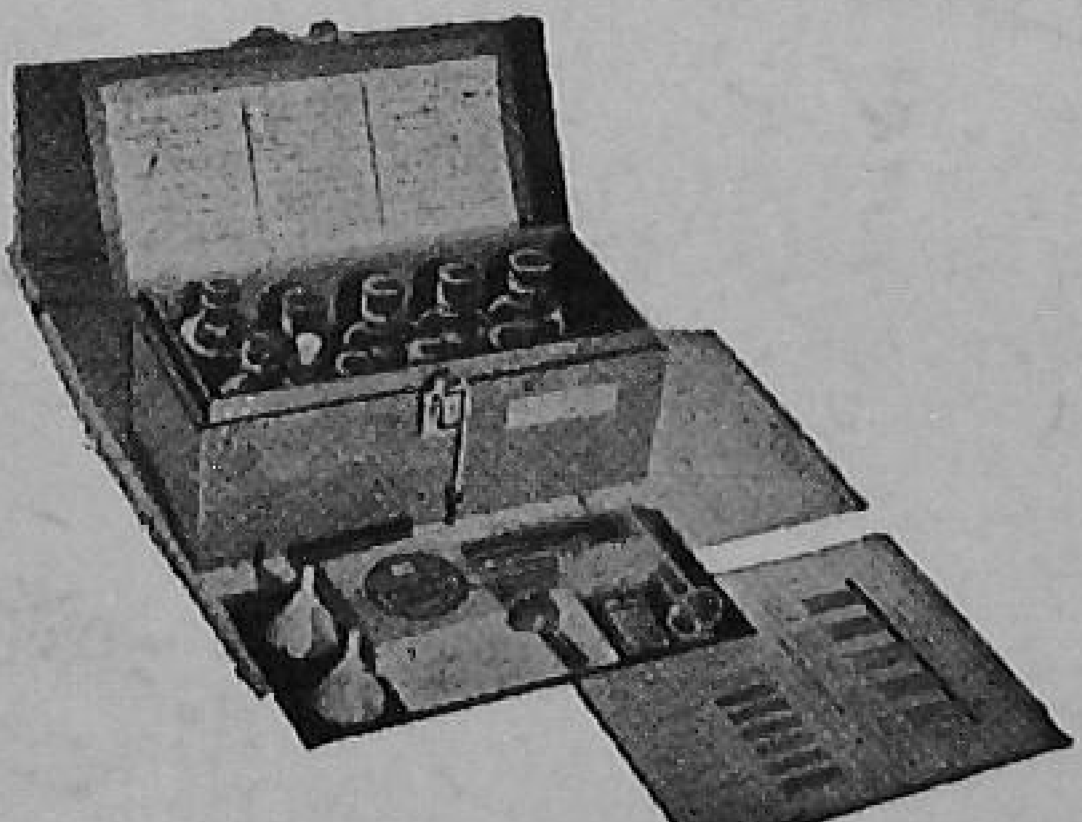

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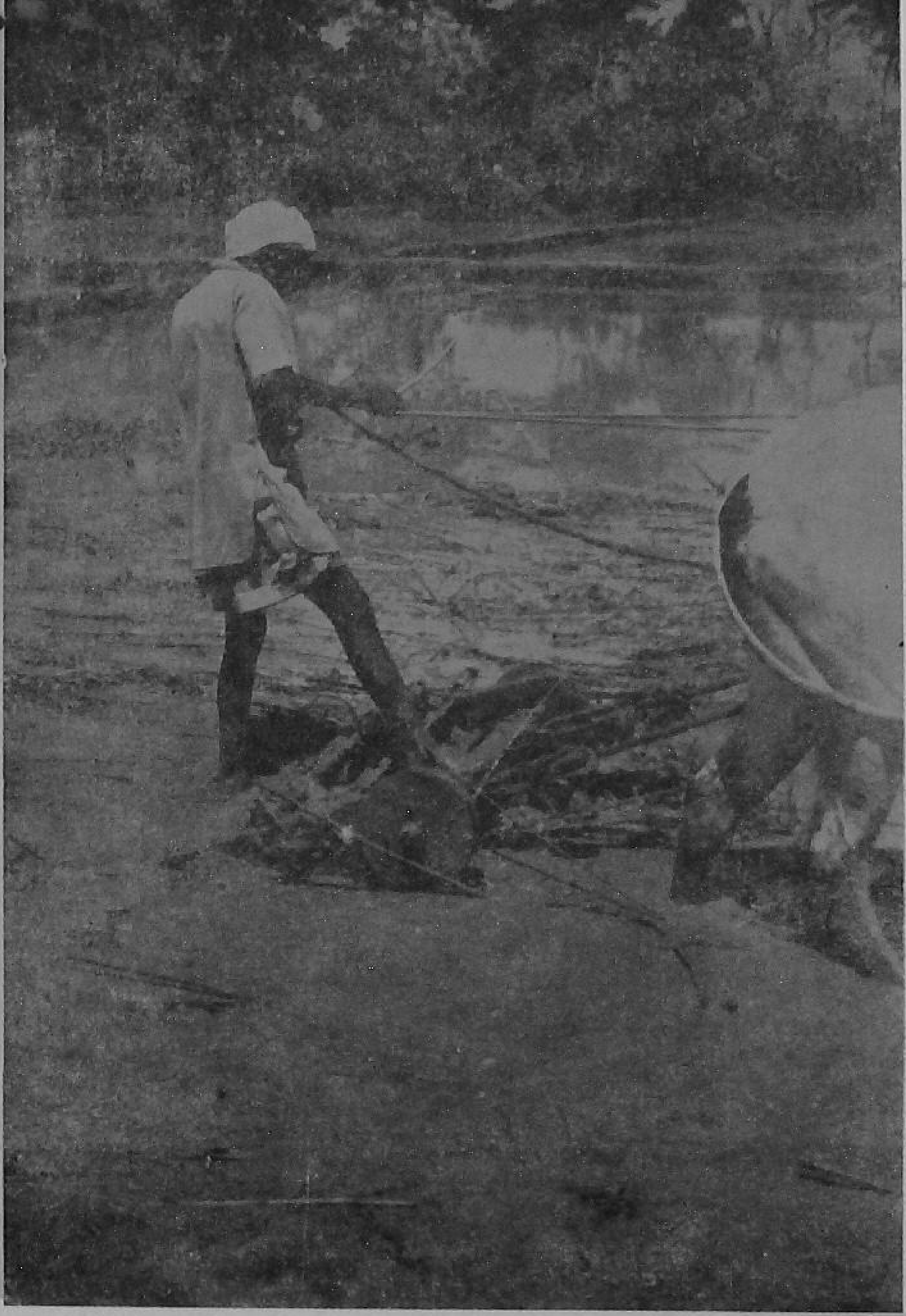
PUDDLING WITH SATOON

By D. N. KHERDEKAR

MANY farmers in Madras State now puddle their fields with a satoon.

This implement is very popular in Burma where paddy is grown under similar conditions as in India. It consists of a three to four feet wide rectangular wooden frame mounted on two wooden wheels of about one foot diameter. Inside the frame, a wooden roller with steel knives is fixed. It rotates freely when the implement is worked. The implement is pulled by a pair of bullocks.



The field is being puddled with a satoon

Work a satoon in your paddy field instead of the last ploughing. The steel blades of the roller which rotates will make a fine puddle. You can puddle two acres in eight hours with this implement and save on time and money. You can also use it for trampling in green manure.

The satoon can be manufactured locally by your village artisan, and it will cost 40 to 60 rupees.

The Madras Department of Agriculture has designed an all-steel puddler on the lines of the satoon. It is available for 60 to 80 rupees.

The secret of a 6,000-pound paddy crop

FARM yields can spiral up with due care of soil and crop, and without doing anything that is beyond the farmer's means. More and more farmers are now finding this to be true, even in the heavy rain-soaked and proverbially poor soils of the West Coast.

Shri R. Krishnan Nair is one such farmer who has been reaping heavy paddy harvests from the lateritic fields in Ulloor village near Trivandrum in Kerala.

His five acres of paddy land, typical of the coastal soil, till five years back used to yield but 1,500 pounds of paddy to the acre. Today, each field averages 6,000 pounds an

Personal attention pays in farming ; Shri Nair on one of his daily rounds of the farm

Among the improved implements he uses, the Japanese hoe is one. He uses this to weed and stir the soil in-between the plant rows

acre, and sometimes, in a good season, a harvest of 6,500 pounds in some of the fields does not evoke any surprise.

Nair credits the officers of the Agricultural Department for helping him know and follow the steps necessary in raising the averages to such a high level.

To work the soil better, he uses an iron plough in the place of the *desi* plough. The only other improved implement he uses is the Japanese hoe for weeding and stirring the soil between the paddy plant rows.

He uses the high-yielding *U.R. 19* and *P.T.B.4* paddy varieties in the place of the local ones—'the very first step in raising a better crop.'

He treats the seed with 'Agrosan G.N., before sowing and dips the seedlings in a copper fungicide before transplanting, so that the diseases don't get any entry into the planted crop.

Since the coastal soils loose their organic matter quickly and the cattle manure available to replace the same is not enough, Nair has found a good solution in glyricidia. This green manure plant planted in interspaces in the coconut garden and on the farm border, provides him with enough green leaf to supplement his cattle manure. He also supplies a hundredweight of paddy fertilizer mixture at the time of planting, half a hundredweight 30 days later, and another half a hundredweight 30 days before flowering.

Timely plant protection measure saves crop losses ; here the crop is being dusted to check the paddy enemies

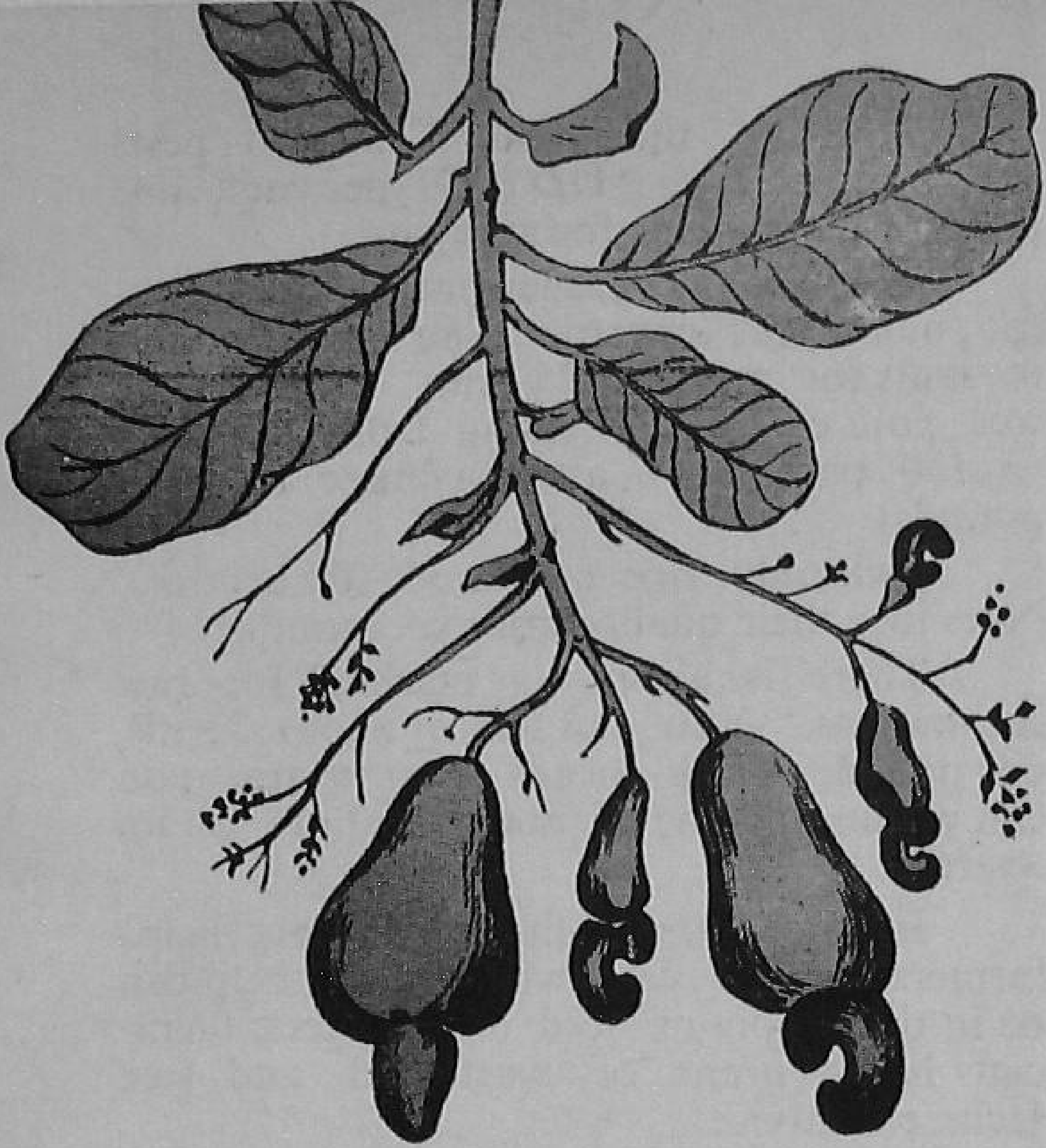
Planting in lines helps make weeding and stirring the soil with a rotary hoe very easy. It saves the labour cost too.

With this treatment, the soil has been giving him a uniformly high-yielding paddy crop.

Similar is Nair's experience with coconuts. His 500 coconut palms, due to neglect, used to produce 2 to 5 nuts per year per tree. Today, they are all yielding 50 to 60 nuts each.

Like paddy, the coconuts are producing this high yield because of good cultural operations and manuring. The glyricidia provides him sufficient manure to give 50 pounds of it to each tree. In addition, each tree gets 6 pounds of coconut-fertilizer mixture. The other thing he does to keep the palms producing well is the control measure he has undertaken for the rhinoceros beetle. The inexpensive beetle-hook is his weapon for the pest.

Nair admits, he is not a solitary example of how attention to soil and crop has raised crop yields very high. There are many like him, he says, in the village itself who produce equally good crops. And they too carefully tend the soil and the crop as Nair does.



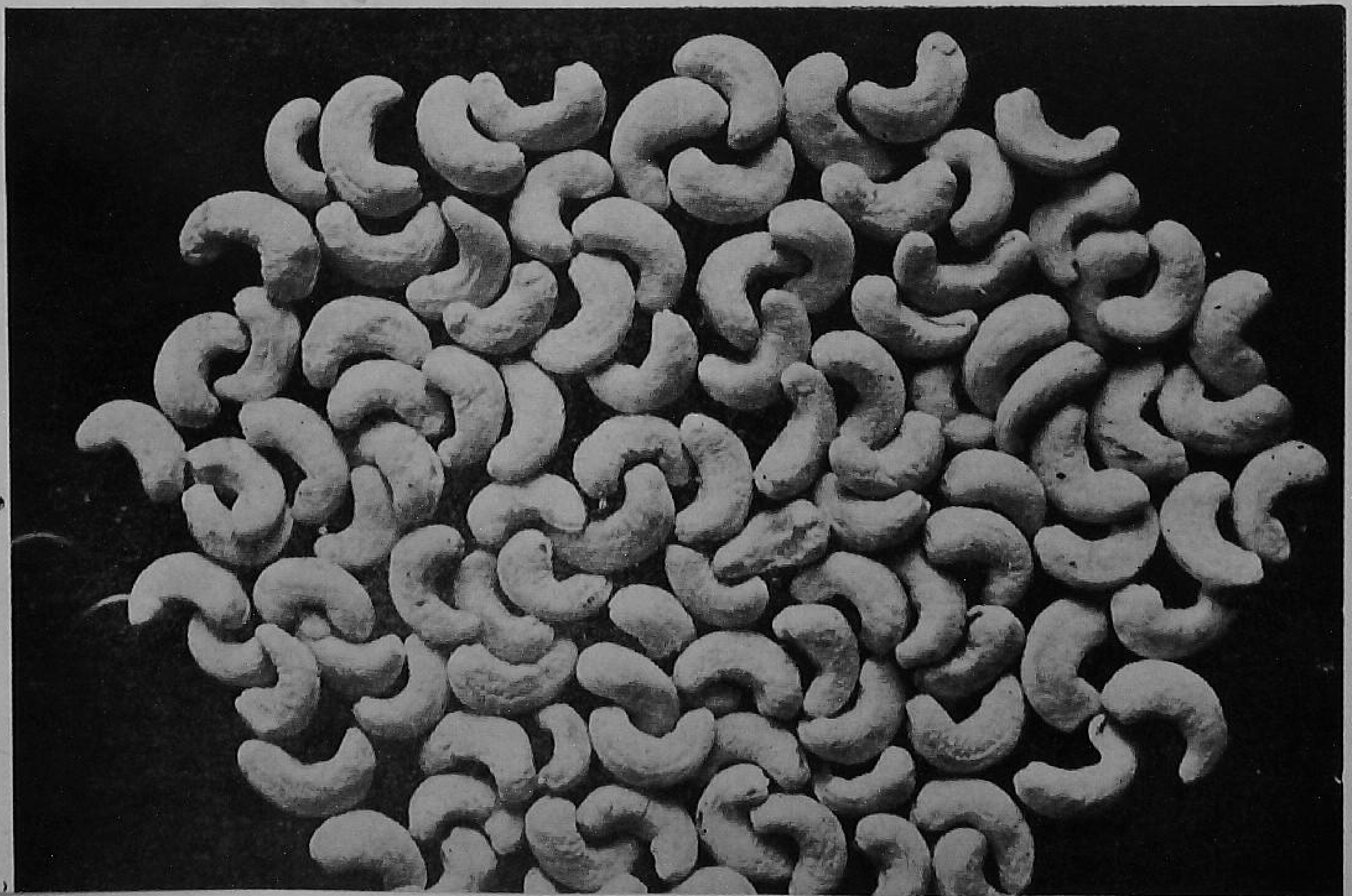
GROW cashewnut on your wasteland, and you will be getting a good, steady income from the land which never gave you anything back anytime before.

The cashewnut will come up in your wasteland if it is well-drained, and does not have the deep black cotton soil. The tree is hardy, and does very well for the little attention you give it.

We produce about 75,000 tons of raw cashewnuts in India a year. This is not enough, and we import a lakh ton of nuts per year to keep our cashew kernel industry busy.

Cashew kernels have a great overseas market. The kernel also is a rich and tasty food. The cashew shell oil, a valuable raw material, is in great demand in many industries. The cashew apple is rich in Vitamin C, and many tasty preparations can be made out of it.

Make your waste land pay



The cashewnut, when grown in waste-land, will not only provide a steady income, but will also be a good way of preventing soil erosion.

Remember these points when you grow cashewnut.

1. Plant 25 to 30 feet apart. You need 70 to 50 trees per acre.

2. It is better to raise seedlings in individual baskets and plant them rather than sow seeds directly in the field.

3. Air-layers of cashew are the best for planting.

4. Plant the seed or seedlings in pits of two feet cube, dug out and refilled with the dug out soil early in the season. Provide also catch pits three feet apart on the upper levels of your land to conserve moisture. Put a good fence around the area.

5. Support the plant with a stick. Mulch around the plant every year.

6. Manuring will increase yield. Give one pound of ammonium sulphate and one pound of superphosphate per tree per year.

7. Take timely steps against pests and diseases. Use DDT 50 per cent, one pound in 20 gallons for spraying.

You will find cashewnut yielding from the fourth year onwards. The tree continues to fruit for another 25 years. From each tree you can get anything from a pound to 150 pounds of nuts (average being 8 pounds).

Pick only ripe nuts and sell in time. Nuts lose their quality after six months.

There is always a market for raw cashewnuts. You can sell at about 35 nP. per pound, which means from a tree you can get an income of about 2.80 nP. on an average.

In some states, the government helps farmers to grow cashewnut. Such help can be in the supply of seed or air-layers, financial helps, grant of wasteland and free technical advice.

Ask the Cashewnut Development Officer of your state or the Agricultural Officer for any help that you need in growing cashewnut.

---

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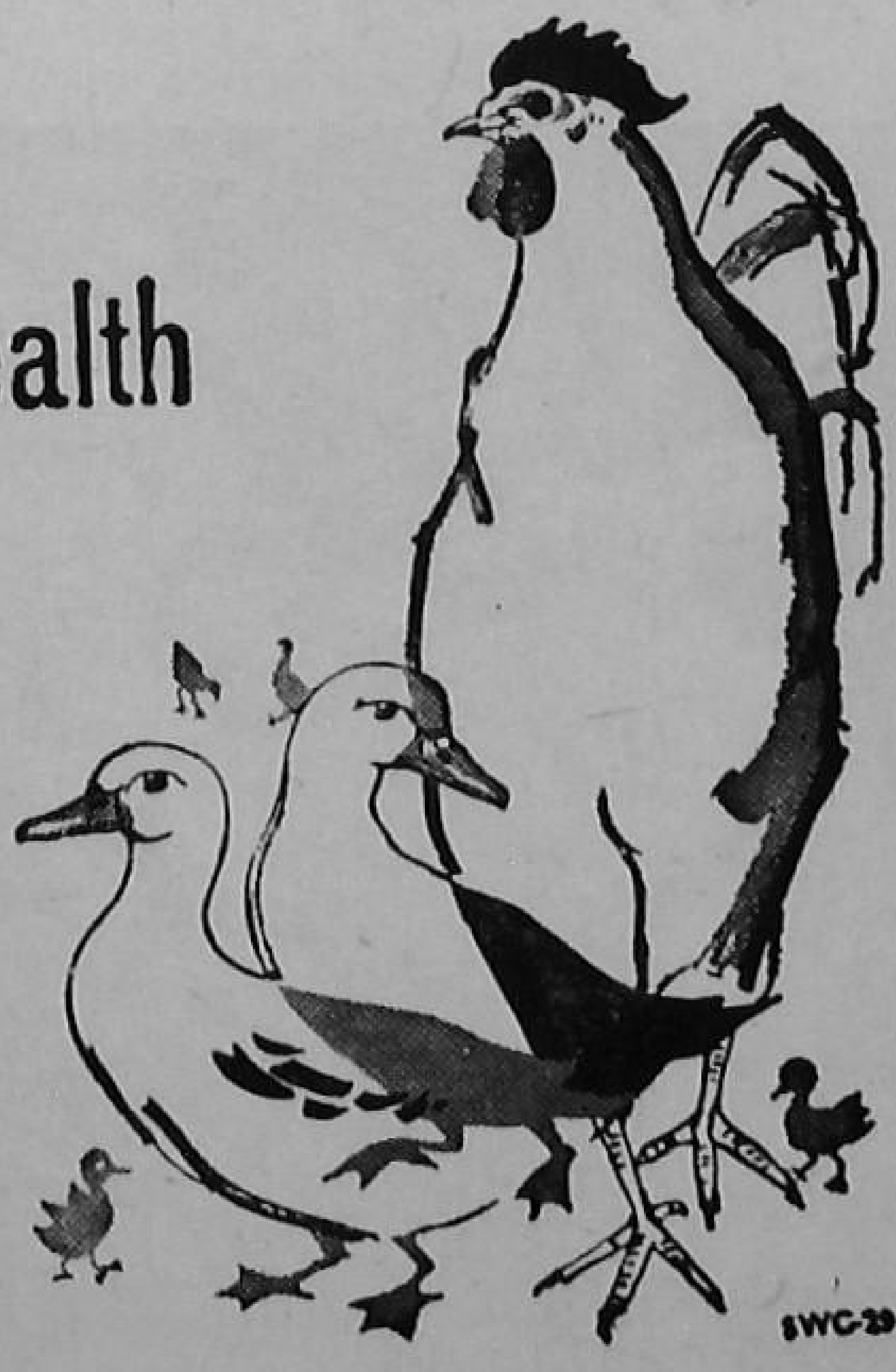
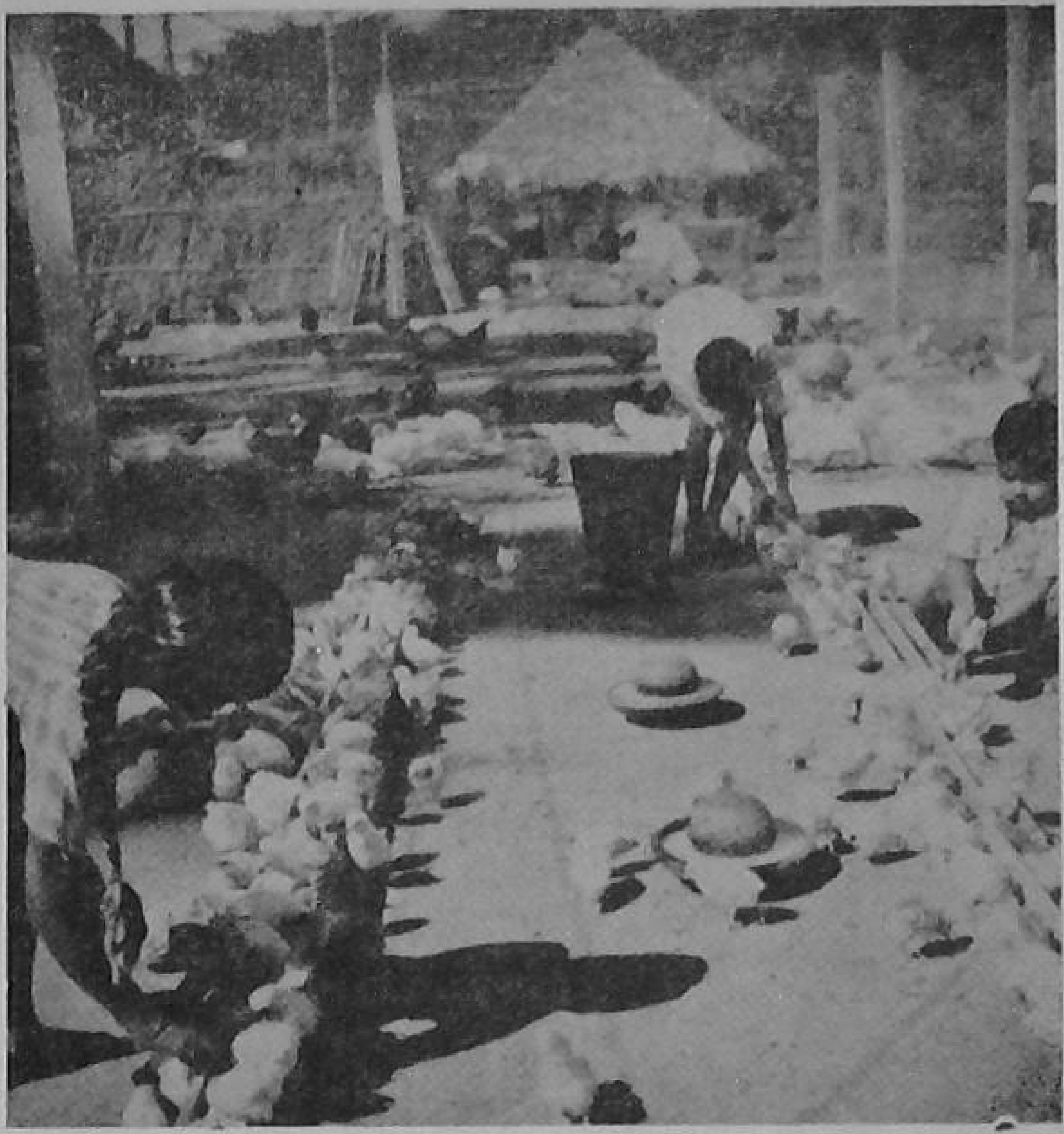


gram. In such a house the birds feel comfor table, especially during the rainy season and seldom remain idle. It is also cool inside during the hot summer days. Fresh quantities of bedding materials are spread in the house regularly in layers. The whole litter is removed once in four to six months and is sold as manure.

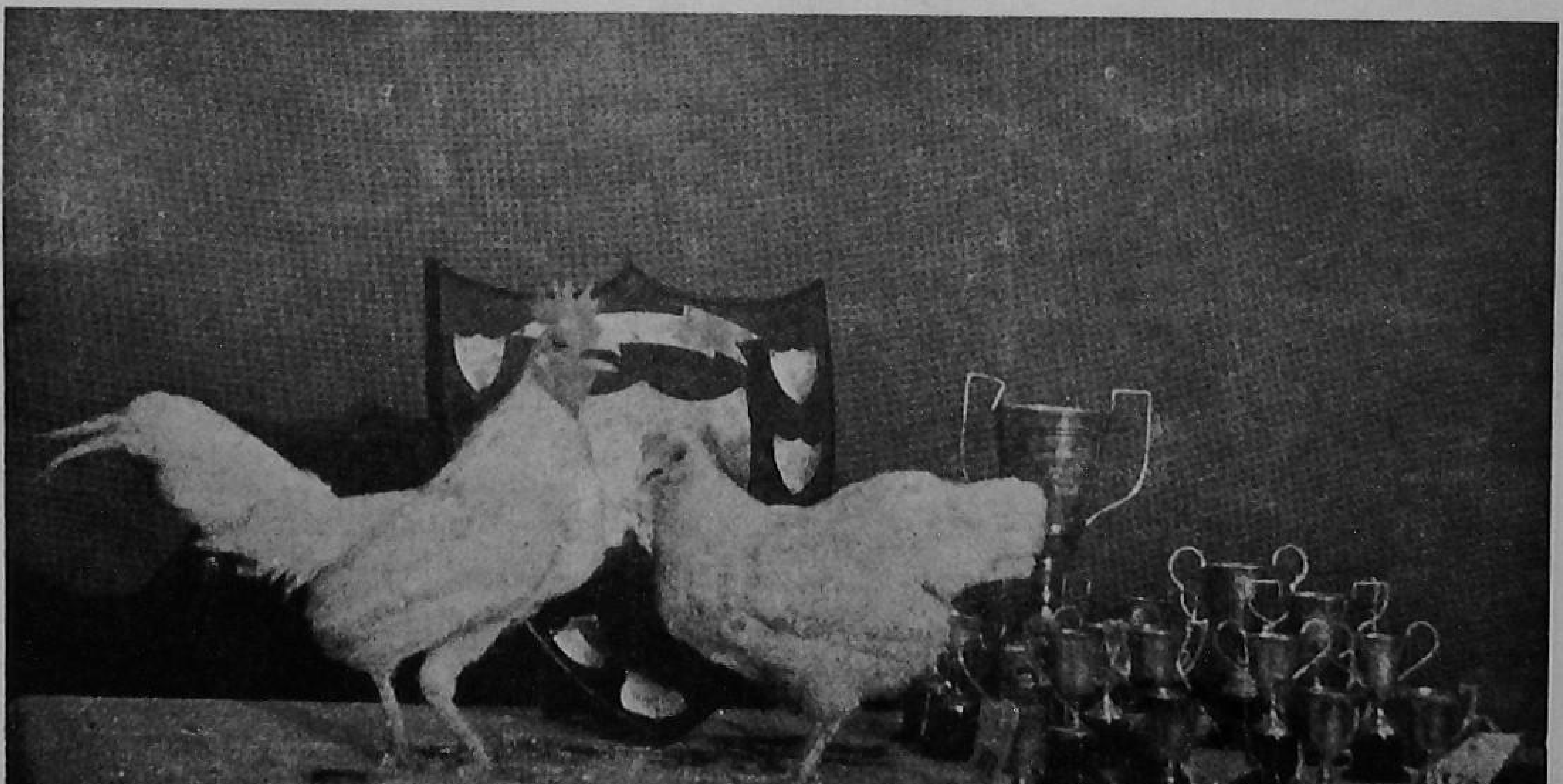
Krishnamurthy knows the benefit of vaccinating his birds against diseases like Ranikhet and fowl pox. Last year, nearly 300 birds of his farm were attacked with fowl paralysis. He had no time to go and call the Veterinary Doctor or the Poultry Specialist. His own experience in poultry keeping and the knowledge he acquired by studying the subject, provided him with the solution. He rushed to the local medical practitioner and got Vitamin B complex tablets. He made a solution of these tablets and administered it to the birds, and saved them all.

Krishnamurthy is now helping many a young poultry farmer set up poultry farms.

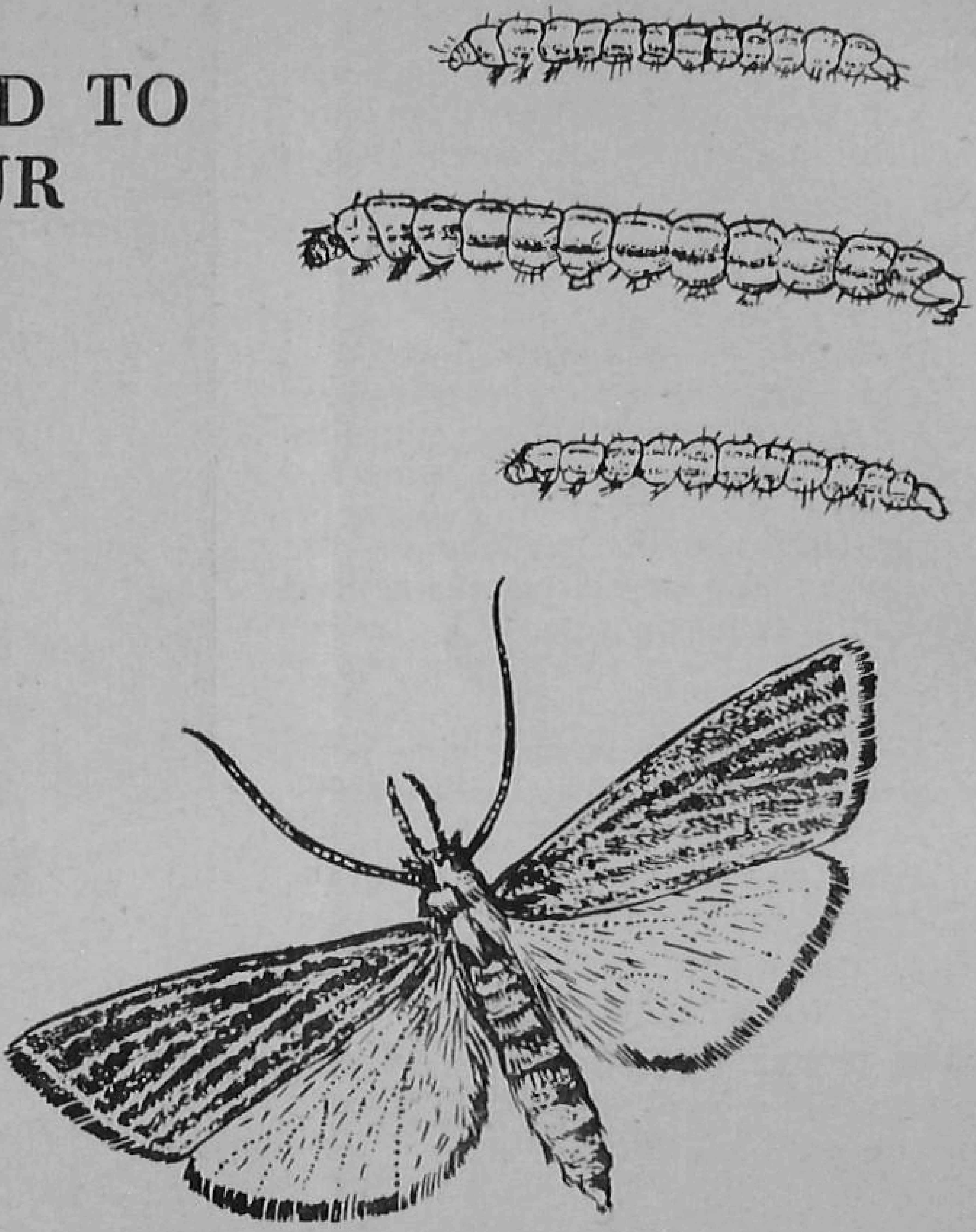


He provides a balanced ration to his birds ; his childr who help him in his work are seen feeding the birds

Here are two of his prize-winning birds along with a few trophies



TIME TO ATTEND TO GURDASPUR BORER



Caterpillars and a moth of Gurdaspur borer

THIS is the time the Gurdaspur borer appears on your sugarcane, and the time to get rid of this serious pest of sugarcane.

The only effective way of doing it is to cut the affected canes close to the soil and to destroy them by burning.

The usual practice of spraying of insecticides is of no use against this pest, as it remains inside the canes. It may even keep itself hidden in the setts meant for the next year's sowing.

The Gurdaspur borer has caused a heavy loss to the Punjab and Uttar Pradesh sugarcane farms.

It must be mentioned that one or two farmers taking the necessary steps to control

the pest in a village is not enough. All farmers should join in this attack against the borer. Then only it will be effective.

It is easy to find if the Gurdaspur borer is present on the crop. The attacked crop shows a blasted appearance with dried-up side leaves and a withered top.

The borer lays scale-like and transparent eggs on the upper side of the green leaves at the break of the monsoon.

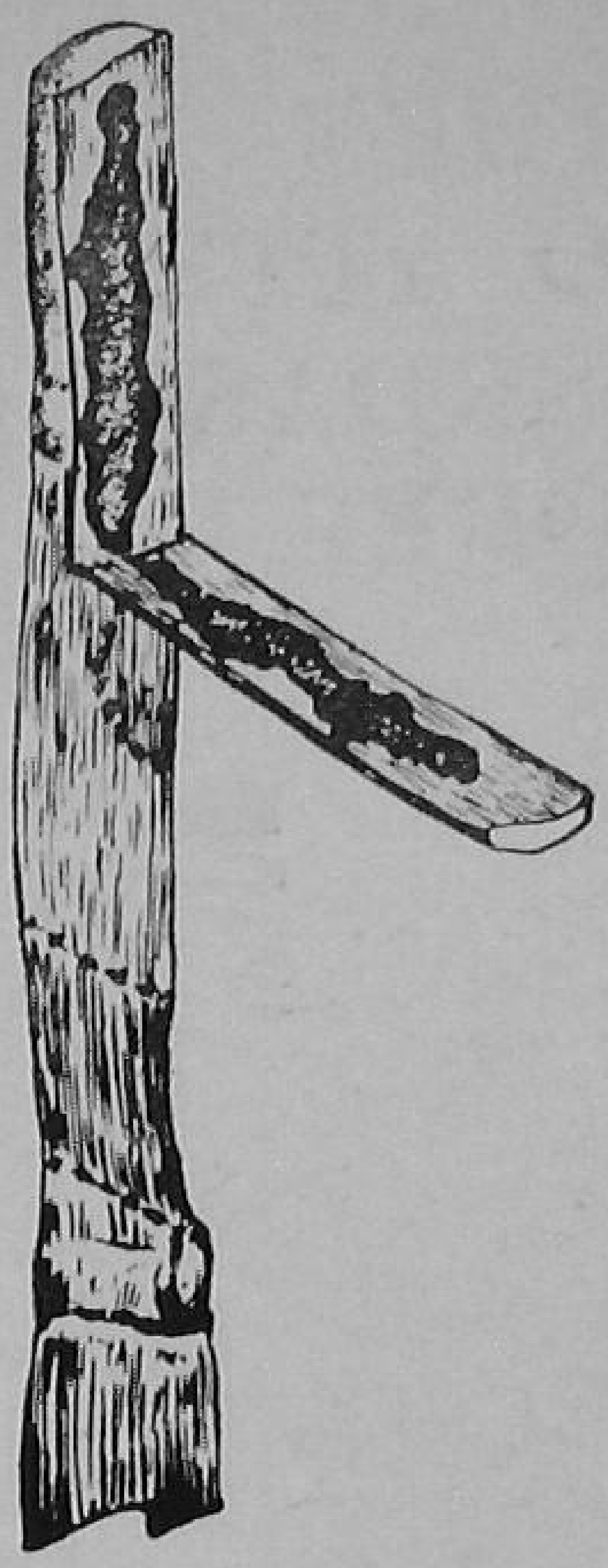
Eggs hatch and cream-coloured caterpillars with orange-coloured head and four reddish brown stripes all over come out.

These young caterpillars hide themselves inside the setts and damage them. They feed on and damage first the top and then the internodes. They begin from the portions below the bud and enter the tissues below the rind where they go on feeding, moving up in a spiral manner. After damaging about two to three internodes this way, they get into the softer layer by making a tunnel to feed on further.

Three days after the caterpillar attacks the crop, the tips start drying up. Six days later, the tops start withering, and a fortnight later the crop gets a blasted appearance. When this happens, the canes stop tillering.

Canes from such affected crop are hollow, soft, thin and short, and are unfit for crushing at the factory. As a result of the attack, fungus also develops, which makes the juice sour and dirty red in colour.

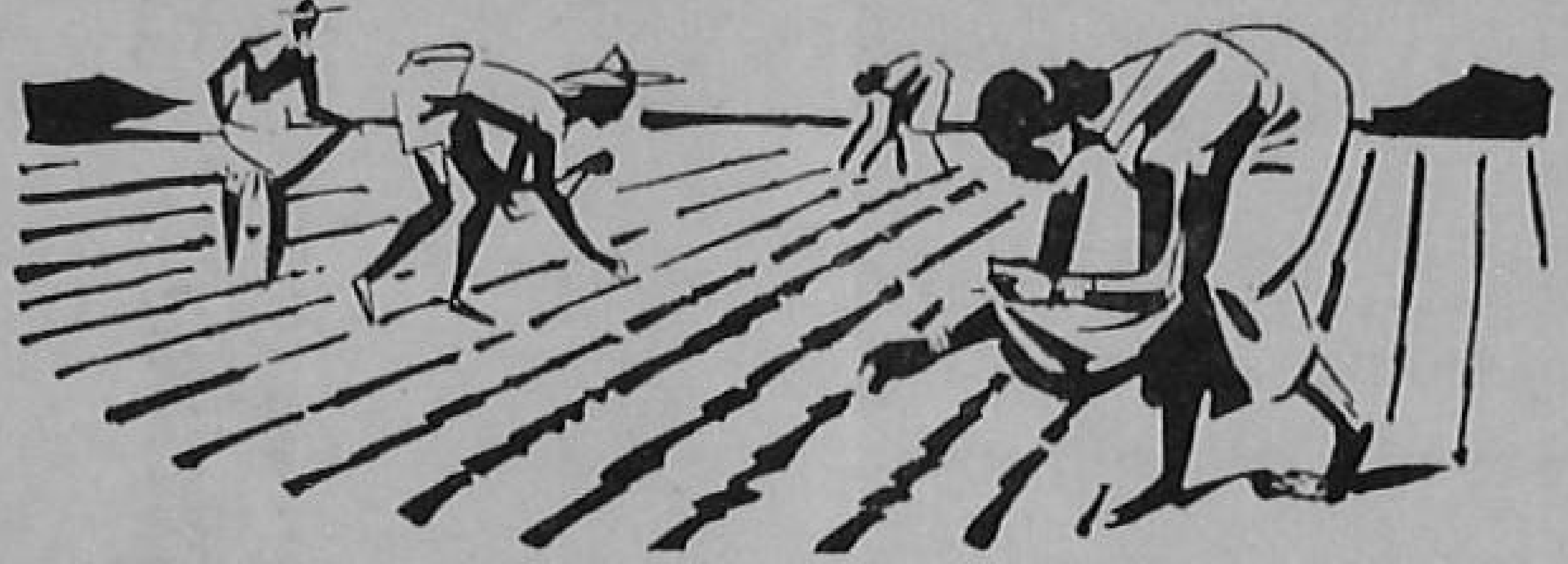
Apart from destroying the affected canes, you should take the following measures for controlling the pest.



A tunnel made inside the cane by the caterpillar

- Grow sugarcane varieties like Co.L.20, Co. 312, Co. 313.
- Grow a ratoon crop, as it resists the pest attack.
- Adopt a lower seed-rate and increase the space between the crop rows.
- Always get healthy seed and soak it in some suitable chemical solution before sowing.

Protect your crops from seed bed to harvest



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Hints on PEPPER GROWING

PLANT ROOTED CUTTINGS

FARMERS and home-gardeners taking up pepper planting on their lands or homesteads during this July are advised to use rooted cuttings instead of any other planting material.

Rooted cuttings, being raised in sufficiently large numbers by the Departments of Agriculture in different states, are taken from high-yielding and bisexual vines, and will give a regular and high yield of pepper.

The rooted cuttings, when obtained, should be planted in 1-1/2 feet cube pits, spaced 12 feet apart, if you are raising a pure crop.

Though planting can be done from July to September in the pepper areas, best results are obtained with July planting.

MANURE THE PEPPER WELL

If you want to have a good harvest from pepper you must manure it well. Here is a well-tried formula for manuring pepper which is being recommended by pepper experts to the growers.

Apply a basketful of cattle manure or compost per vine before the break of the south-west monsoon, with two ounces of ammonium sulphate along with it. Follow by four ounces of groundnut cake.

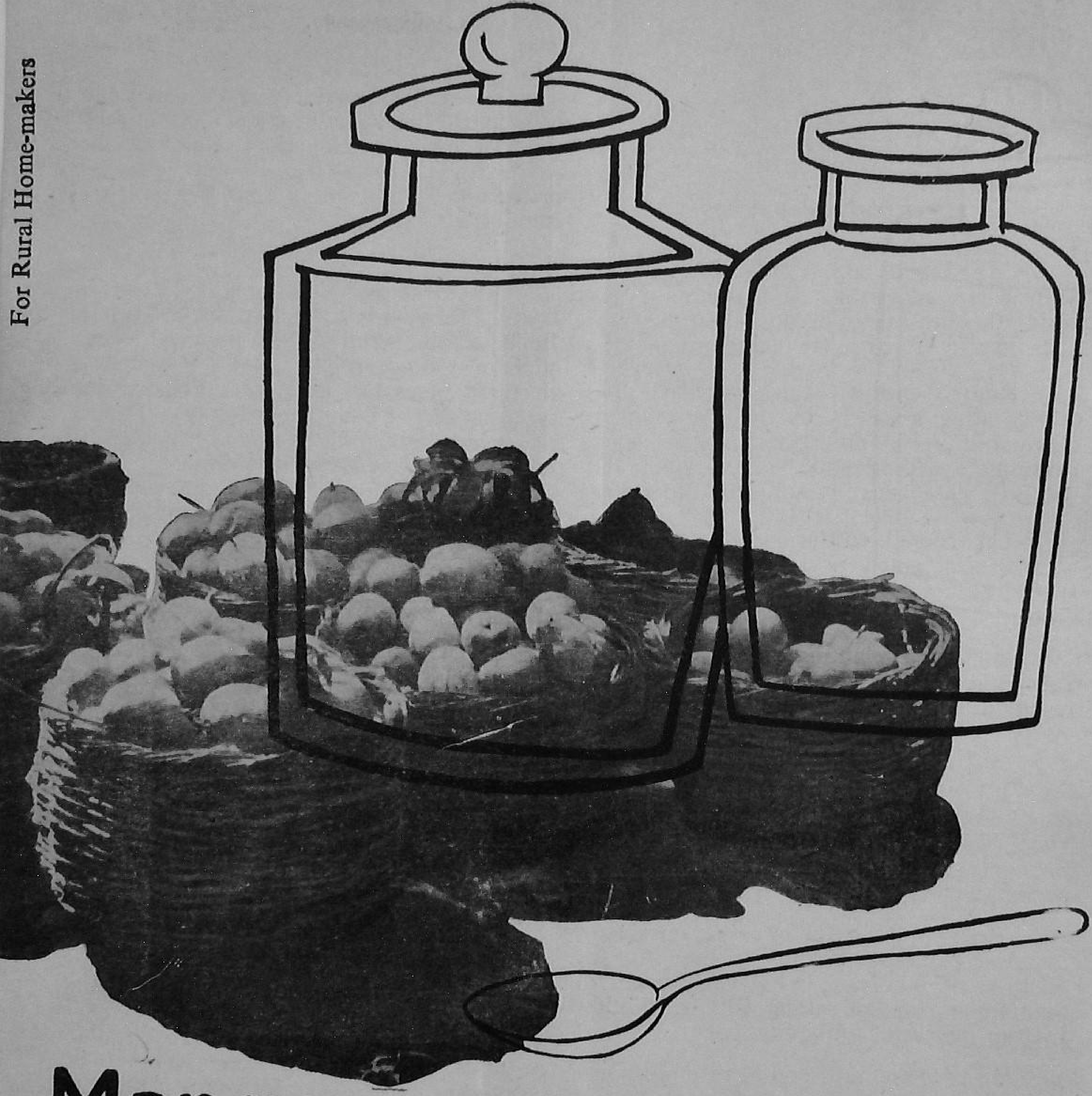
Just after the south-west monsoon, apply four ounces of sulphate or muriate of potash.

Just before the north-east monsoon, apply another four ounces of groundnut cake and four ounces of superphosphate or bonemeal.

Every alternate year, give each vine four ounces of slaked lime.

The manures and fertilizers, excepting for slaked lime, should be applied a foot away from the stem of the vine, all round within a radius of two to five feet. They can be applied nearer the stem for young plants and further away from it for older plants.

Apply ammonium sulphate and potash as top-dressing and the others at a depth of six inches in the soil. Slaked lime can be applied closer to the vine, but should be well-mixed with the soil. If it is applied in the non-rainy season it is necessary to water the vines after application.

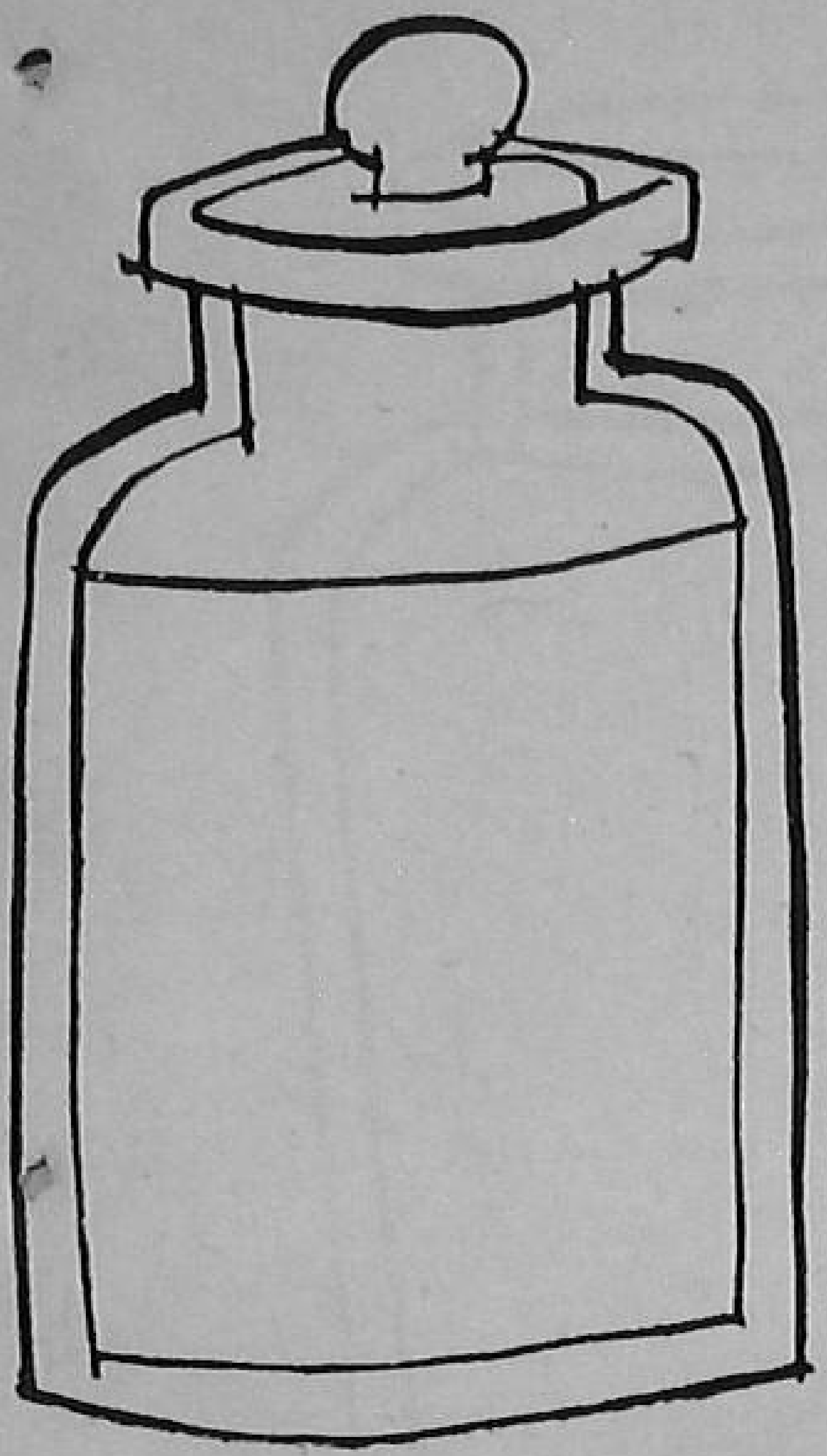


Mango when you order

THERE is one way you can taste mangoes all the year round: preserve mangoes when they are in plenty. Here are some preparations which you can try this season.

DRIED MANGO SLICES

Wash firm unripe fruits with water; peel the fruit with a stainless steel knife, cut it in



By R. K. SHUKLA

small pieces, and throw away the stones. To prevent browning, dip them in two per cent solution of common salt for 15 minutes. Keep the slices in the strong sun and dry them completely. Pack in dry containers.

MANGO PRESERVE AND CANDY

An excellent preserve and a candy can be prepared from raw mangoes. After peeling, cut fruits in small pieces ; for candy use whole fruits. Prick them with a stainless pricker and dip them in four per cent salt solution for 24 hours.

Take one seer of sugar for one seer of fruit. Make syrup with two seers of water. Boil slices in syrup for ten minutes. Keep slices in syrup overnight. Boil the syrup two to three times the next day. Pour out the syrup on slices ; keep them overnight. Repeat this every day till the syrup reaches a consistency of honey. Allow it to stand for three days. Then boil slices for 15 minutes in the concentrated syrup. Now the preserve is ready.

For candy, consistency of the syrup may be further increased by boiling the slices for ten minutes more in concentrated syrup. Cover slices or whole fruits in dry sugar and pack in sterilized containers.

MANGO JELLY

Excellent jelly can be prepared from two to six-week-old fruits. After washing, peel fruits and cut them into pieces. Boil in water (1½ times the quantity) for 30 minutes. Strain the juice through a thick cloth.

Recipe is:

Juice	1 seer
Sugar	3/4 seer
Citric acid	1 gram

Add sugar and citric acid to the juice; (if the juice is too acidic no acid is added) put it on fire till it boils. Cool it down and fill in sterilized bottles. Jelly will set within 24 hours.

MANGO CHUTNEY

Wash raw fruits and peel them. Dip in two per cent salt solution to prevent browning. Grate fruits with a stainless steel grate. Recipe is:

Mango slices	1 seer
Sugar	1 seer
Salt (finely ground)	3/4 *chhatack*
Red chillies (finely ground)	1/4 *chhatack*
Spices (Ginger, Cumin, Cardamom, Cinnamon powder)	1 *tola* each
Onion and garlic (finely chopped)	1/2 *chhatack*
Vinegar or 6 per cent acetic acid	2 *chhatack*

Now dip the slices in boiling water for five to eight minutes to make them soft. Drain out the water. Add sugar and salt to it. After 30 minutes put it on fire. Bag the spices, onion and garlic in a thin muslin cloth and put it in the boiling mixture. Heat it to a thick consistency. Squeeze out the spices by pressing it with two ladles. Add vinegar and cool it. Fill in sterilized containers.

MANGO PICKLES

There are many recipes of pickles. Here is one which is most common.

Peeled slices of under-ripe mangoes	1 seer
Salt	3 *chhatacks*
Red chilli (powder)	1/2 *chhatack*
Turmeric (*haldi*), Aniseed (*sauf*), Cloves (all powdered)	1/2 *chhatack* each
Fenugreek (*methi*)	1 *chhatack*
Mustard oil	4 *chhatack*

Now fry all spices in a little oil. Mix slices in these spices. Add salt, and keep them for two days in the sun. Place slices in another jar. Add oil just to cover the slices. Mango pickle will be ready within 15 days.

MANGO JAM

Mangoes from grafted trees are best for preparing jam. Select slightly ripened fruits and make slices after peeling. Crush the slices to make a thick paste. Recipe is as follows :

Mango juice	1 seer
Sugar	1 seer
Citric acid	1/2 tola

Add sugar and citric acid to the juice. After boiling cool the contents and fill in sterilized jars.

MANGO SQUASH

Fruits from seedling mango trees are best for squash. Squeeze out the ripe fruits to extract the juice. Recipe is as follows :

Mango juice	1 seer
Sugar	1½ seer
Citric acid	2 *tolas*
Water	2 seers
Potassium metabisulphite (Preservative)	2½ *masha*

Make syrup of sugar and citric acid in water. Add juice to it and strain. Add preservative after dissolving it in a small quantity of water. Fill in sterilized bottles and cork them. Seal bottles by dipping in hot melted wax.

MANGO LEATHER

Wash well-ripened fruits of seedling mango trees. Extract the juice; strain it to remove fibres. Add potassium metabisulphite (two *mashas* for each seer of juice). Now spread the juice in thin layers on trays smeared with an edible vegetable oil. Place the trays in the sun for drying.

When the first layer dries up, spread another on the first one. Repeat this process till a 1/8 to 1/4 inch thick layer is formed. Cut it in small pieces; take them out of the trays and wrap in plastic paper. Pack in dry containers.

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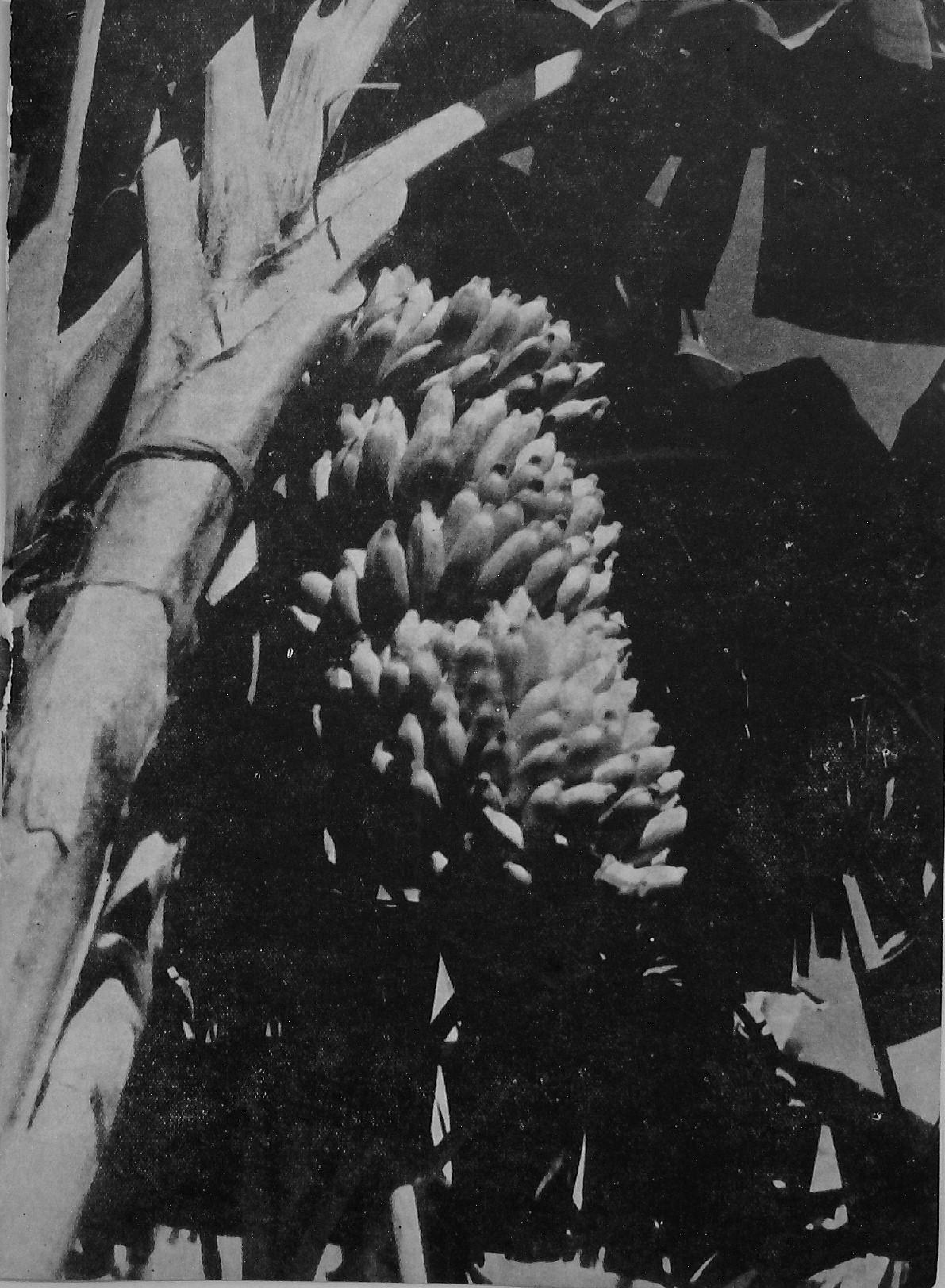

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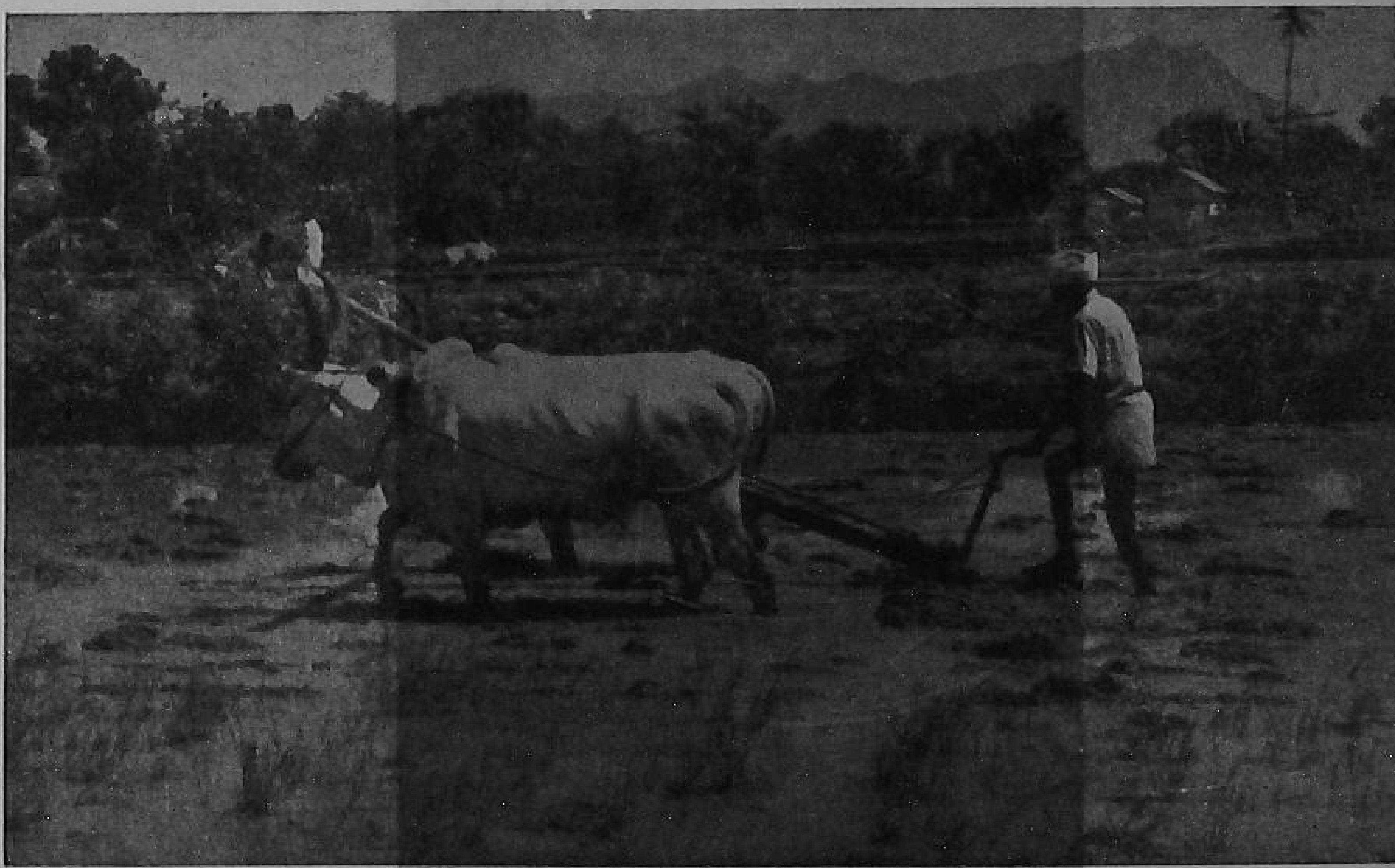

THE FARM AND FARM HOME MAGAZINE

July, 1962

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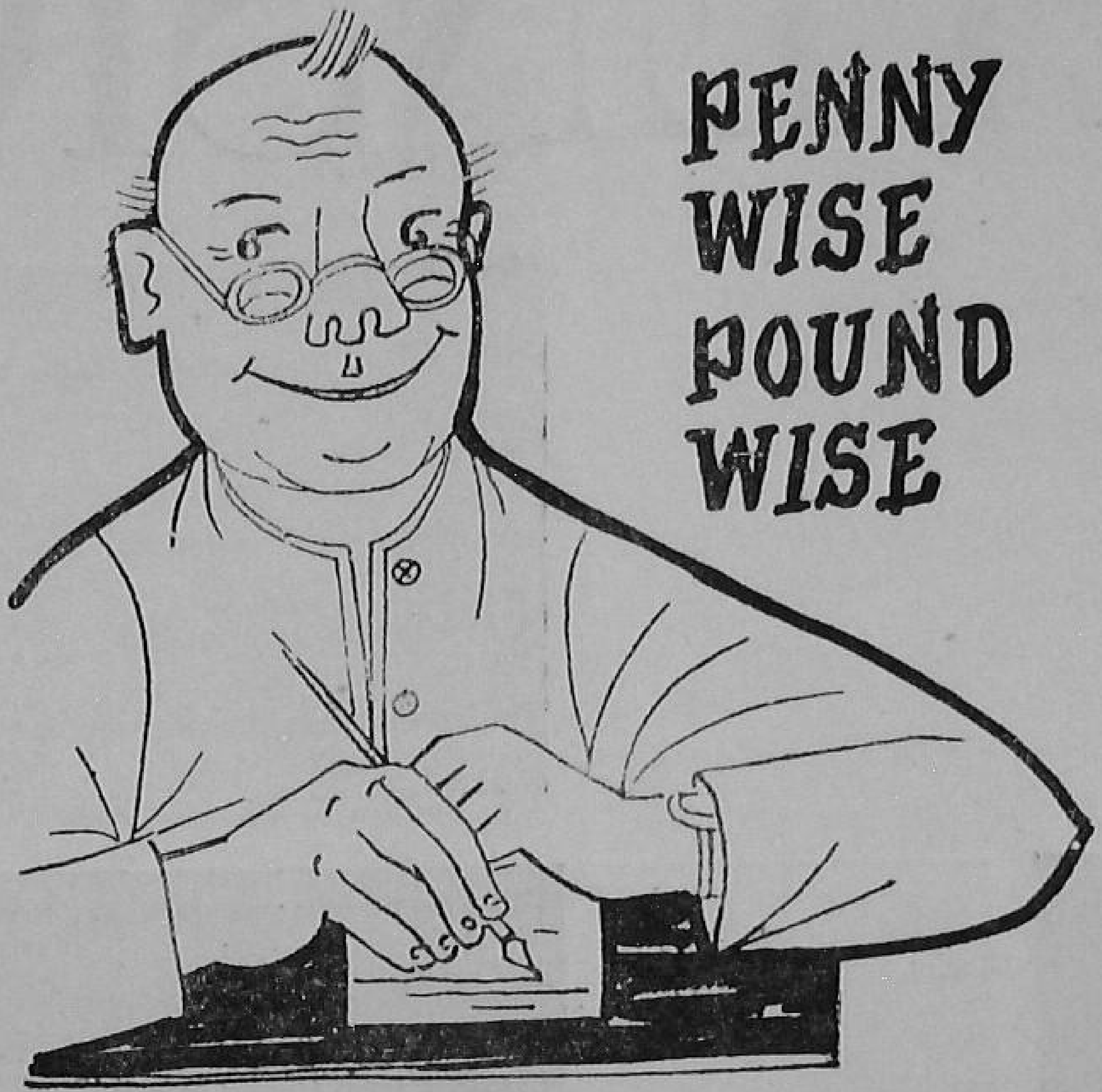

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Vol. III JULY 1962 No. 1

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In agriculture, it pays to do the right thing in a right way and at the right time. If you are a rice grower, see that you obtain a good puddle before transplanting seedlings. And to get the most out of your land, remember to follow good crop rotation ; rice—cotton is one such rotation. Also, now is the time to plant some trees, whether for shade or for fuel. But, do not forget to select the right ones.

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MORE CROPS, MORE PROFITS FROM RICE LANDS

By M. V. VACHHANI, M. S. CHAUDHRY and M. V. RAO

IN MOST of our rice-growing areas, rice is taken after rice, the land being kept fallow between the two crops. Farmers do not follow crop, rotations as they do in dry land cultivation because of want of irrigation facilities and poor control on drainage.

However, in the well-drained unlands and where soils can keep moisture in them, a catch crop of a quik-growing legume is taken. And where there is good supply of irrigation water, either another crop of rice or a *rabi* crop is raised.

The Central Rice Research Institute at Cuttack, Orissa, tried to find out what crops could be grown after rice and what effect this would have on the soil.

A short-duration rice was grown in the main season, and harvested in October. Land was next made ready, and various crops were tried.

Itw as found that a rice crop that followed groundnut and a mixture of *mung* and *pillipesara* gave higher yields. Growing groundnut after rice gave the best profits. Cotton after rice was the next best from the profit points of view.

Try *Pillipesara—mung* mixture before rice and see what a good crop of rice you get

LEGUME-RICE

Legumes not only give some profits from their seed, but also increase the fertility of the soil. What legume to grow depends on soil and other conditions, but gram, horse-gram and black-gram are the most suitable ones.

In the experiment at the Institute, a mixture of *mung* and *pillipesara* was grown, the *mung* allowed to seed and the *pilli pesara* buried in the soil as green manure. This mixture was found to have good effect on the rice crop that followed, resulting in increased yields.

RICE-GROUNDNUT

In south and east India, where the winter is not very severe, growing groundnut after rice, where irrigation is possible, is found profitable. In the experiment also, such a rotation gave very good results, the groundnut yielding 2,086 kilograms of pod and the rice crop which followed yielding 3,152 kilograms of grain per hectare.

RICE-COTTON

A short-duration medium staple cotton is another crop that is grown after paddy in the south and east India. In the Cuttack experiment, *P. 216 F*, an early maturing variety (sowing in November and last picking in May), gave 1,174 kilograms per hectare of seed cotton.

Hence, where irrigation is assured, farmers can grow groundnut or cotton to get a better income from their land.

DOUBLE RICE CROP

In the South, double cropping of rice is practised where canal water is available or rainfall is assured from the monsoons. Here, production can be increased if a suitable green manure crop is raised in-between the two rice crops.

Make your farm pay more—grow cotton after rice

Experiments at the Institute showed that by growing *mung* or *dhaincha* between the two rice crops, a total yield of more than 4,600 kilograms of paddy per hectare could be obtained.

RICE-JUTE

Jute-rice is another rotation already followed by some farmers, as jute, like rice, can grow in water-logged fields. Jute can be sown in April and harvested in August-September. A rice crop can be raised next. At the Institute, the jute crop before rice yielded 975 pounds of fibre. Rice variety *T. 1242* of 160 days duration, which followed, gave over 2,500 pounds per acre.

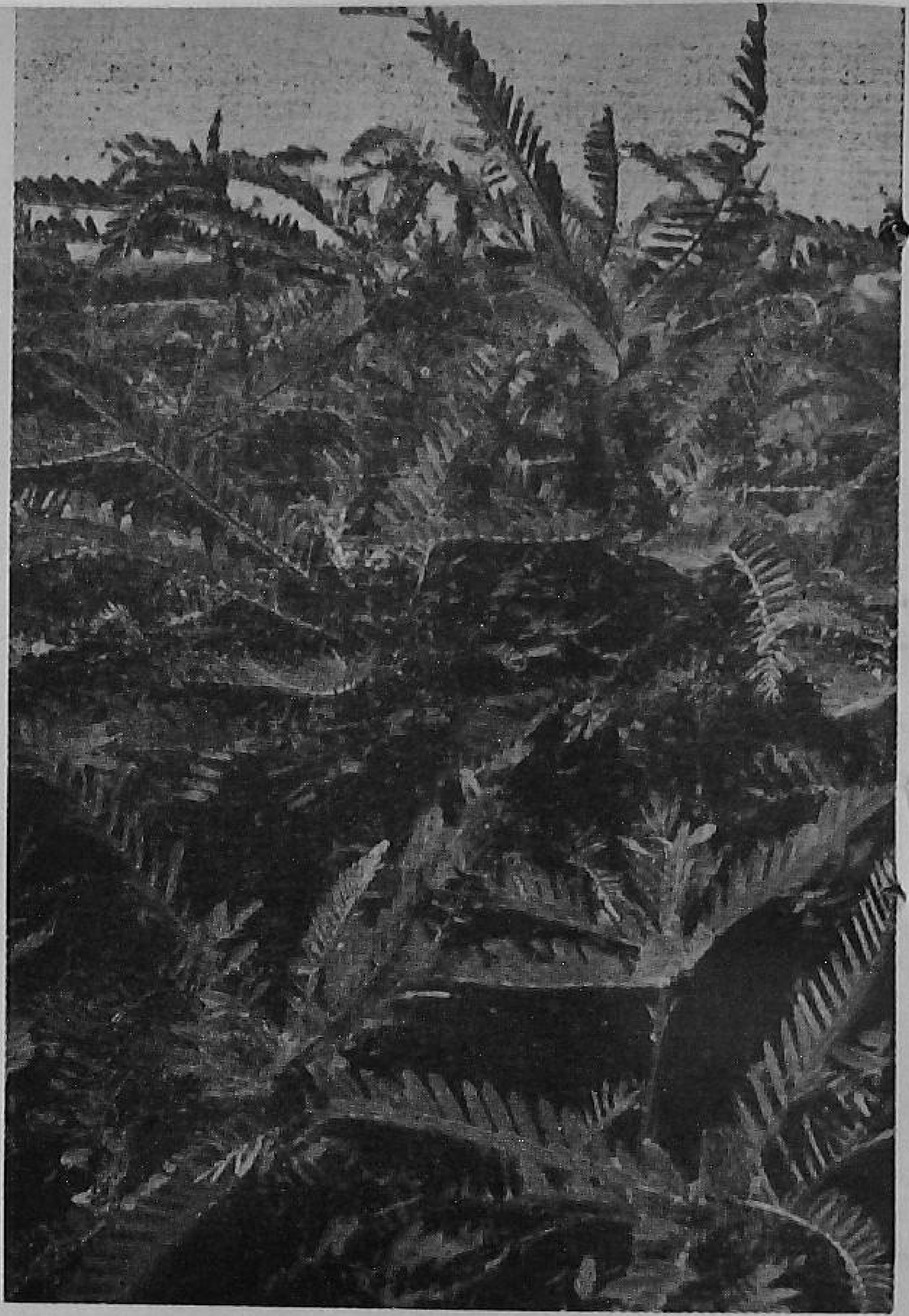
THREE RICE CROPS

Where soil is well-drained, it is even possible to grow three crops of rice in a year.

To get good results, farmers should plant the first crop of a short-duration variety in the middle of March to be harvested by the first week of June.

This they should follow with a medium-duration variety and grow it in the main season of July to December. The third crop they have to sow by the middle of December which will be ready for harvest in April.

This way, a yield of over 10,000 kilograms of paddy can be obtained from an acre, provided judicious manuring of crops is done.



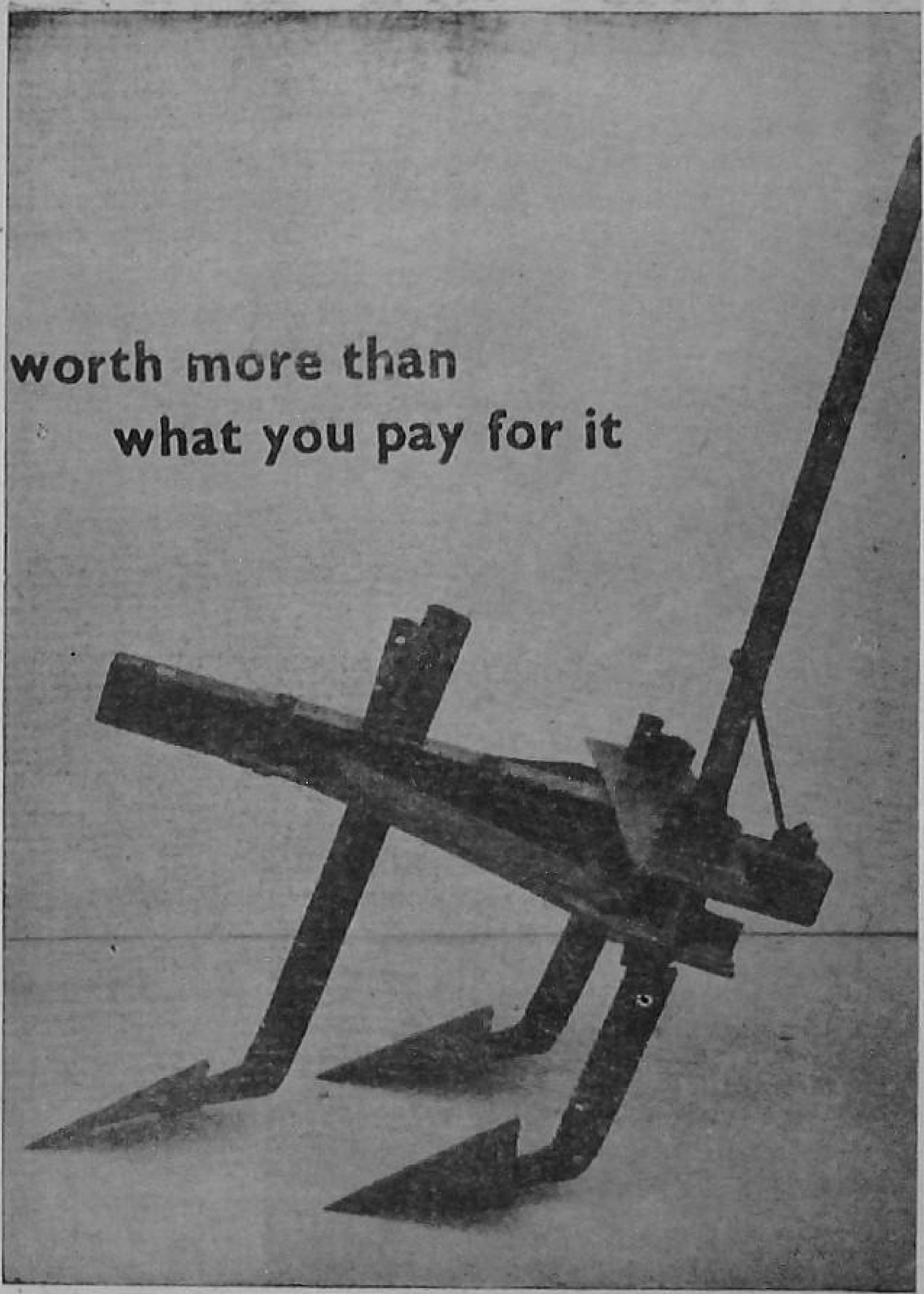
If you are taking two crops of rice a year, grow *dhaincha* in-between the crops

Rice—Jute is rotation which you can follow even in low-lying water-logged areas

Thus, results of experiments show that where irrigation facilities are available, it is better to cultivate the land than to leave it fallow. The kind of crop to be grown depends upon the soil and climate.

1. Where you can plough your land just after you have harvested early or medium-duration paddy, raise a crop of groundnut or cotton.
2. Where the conditions do not allow you to raise these crops, try raising two crops of rice or follow a jute-rice rotation.
3. Where the soil is well-drained, see if you can not raise three crops of rice by adopting judicious manuring Schedules and improved cultural practices.

The BARODA HOE worth more than what you pay for it



By D. N. KHERDEKAR

UNLIKE the farmers in north India, those in the Deccan use *douras* or small-sized *bakhars* or blade-harrows to intercultivate their crops like cotton and groundnut, the main crops sown in lines. They attach two to three such *douras* to a long yoke and work them with a pair of bullocks. They train the animals in such a way that the *douras* are worked in-between the crop rows with no damage to the plants. This way, they finish weeding quickly.

But even these farmers find it difficult to work the *douras* when the black cotton soil becomes dry and hard and when last two hoeings are to be given. The bladed harrows cannot get into such a soil.

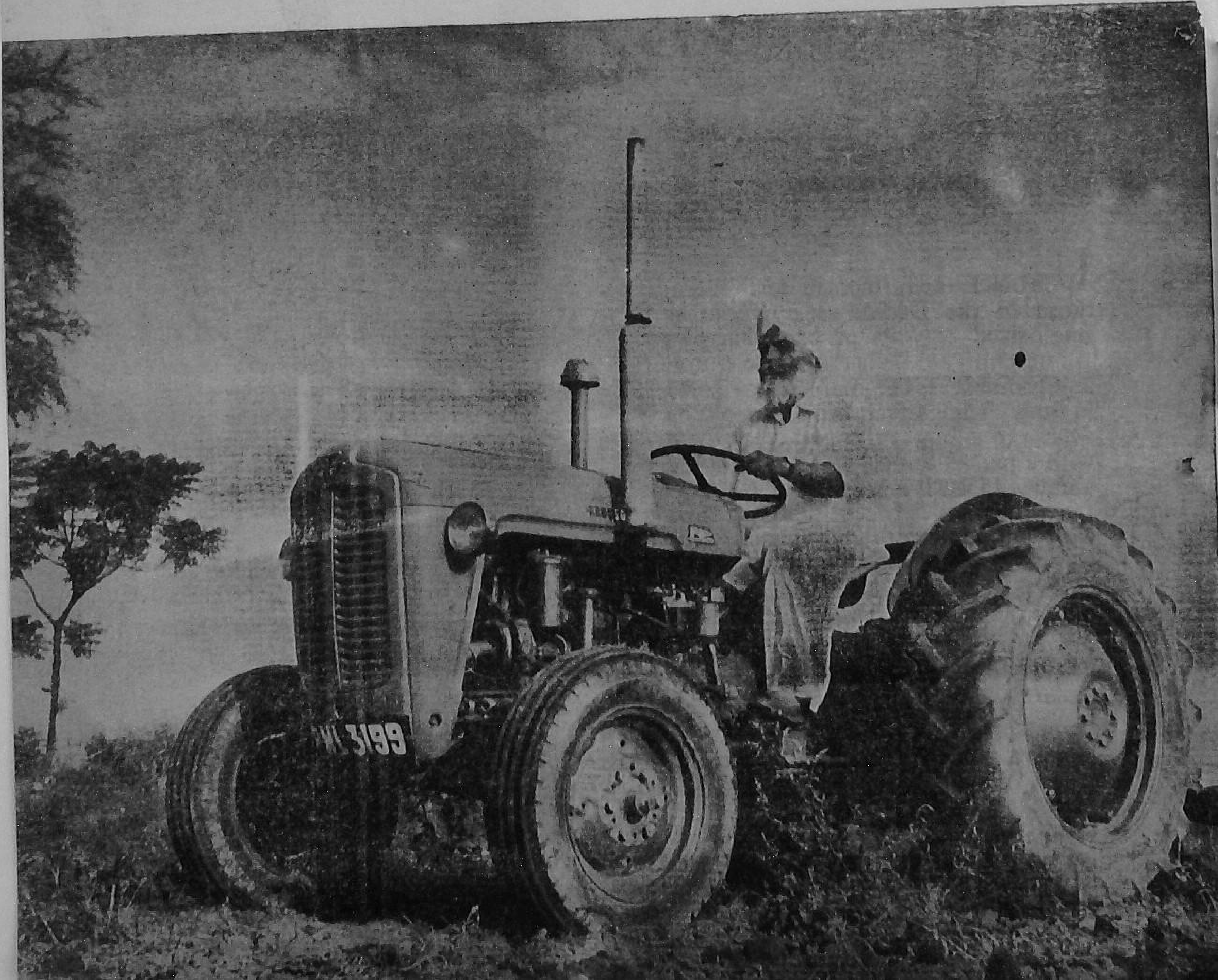
Research was carried out to design a hoe which can work in hard soils. As a result, the Akola hoe was designed. A further improvement of this is the Baroda hoe. In this, the distance between the tines can be adjusted according to the need. The tines are fixed to the steel body by means of wedges. The share points are triangular and sharp. These can be taken out and resharpened.

In a medium soil, two such hoes can be yoked to a pair of bullocks and worked. But in very hard soils, only one hoe can be pulled by a pair of bullocks.

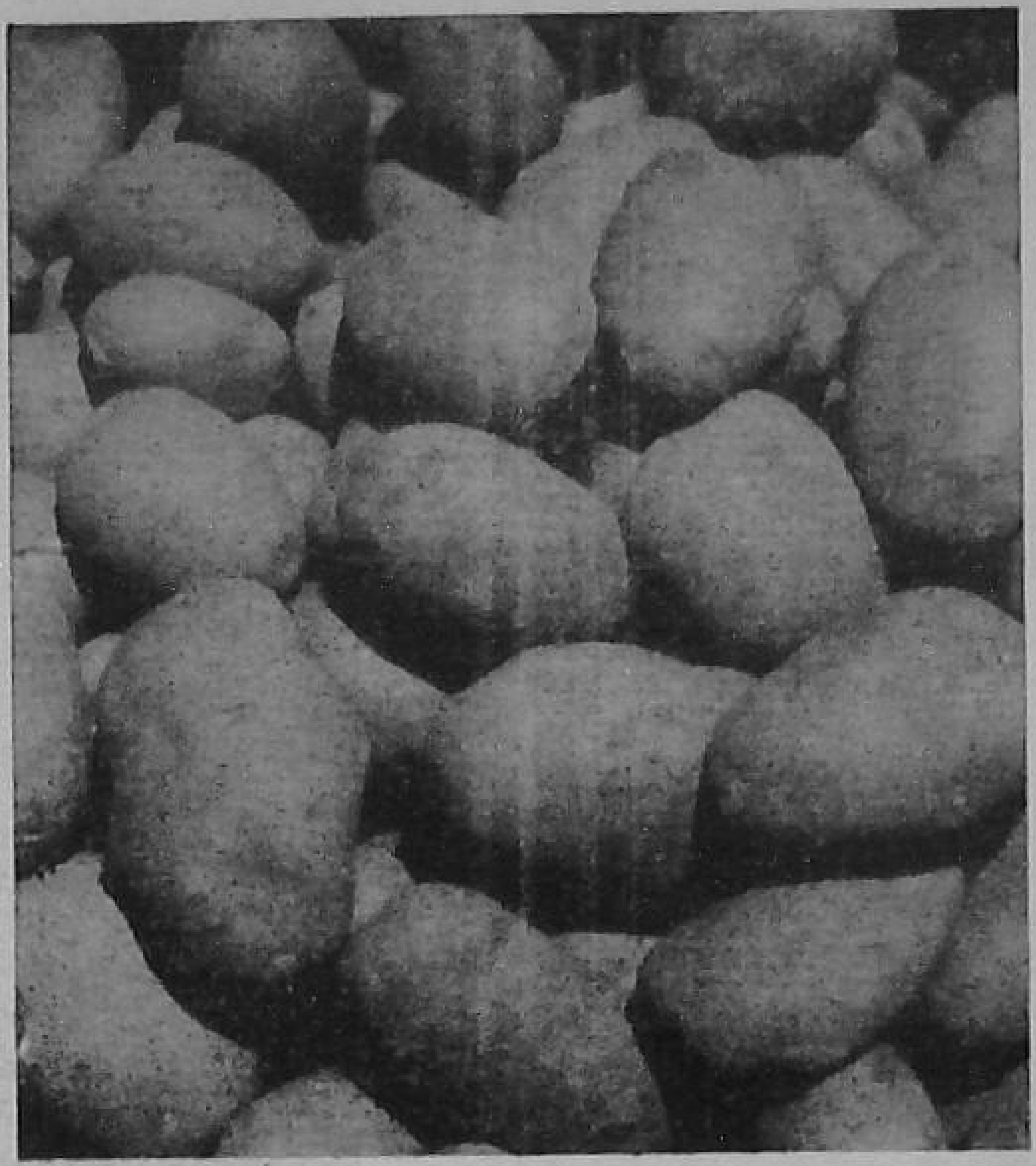
A Baroda hoe costs about 30 to 40 rupees, and can be manufactured by a village blacksmith.

If you are in the North and sow your crops in lines, you will find the Baroda hoe giving you back much more than its worth in money.

He owes it all



to Potatoes



By G. S. SANDHU

FARMER Gurmukh Singh of Salem Tabri, near Ludhiana, Punjab, today earns a profit of 35,000 rupees every year from his 26-acre farm. Eight years ago he was earning just enough to make both ends meet by growing berseem on his eight-acre farm. "It is all due to potatoes," Gurmukh Singh says.

It was in 1954, that his friend Gurmel Singh (Pilot Project Officer, Ludhiana) took him to Dhogri Farm and showed him how potatoes are cultivated, and gave him enough seed of *Military Special* and *Darjeeling Red Round* to plant an acre on an experimental basis.

The success of the trial so impressed Gurmukh Singh that he put all his eight acres under potato subsequently and earned enough profits to add another nine acres to his holding in 1957.

Since then he has purchased six more acres, making his holding 26 acres, on which he grows potatoes, tomatoes, brinjals and other vegetables.

Gurmukh Singh is a staunch believer in the Punjabi adage, *kheti khasman seti* (agriculture pays to the owner cultivator). He himself ploughs the land with his tractor (he was able to purchase the tractor only after he started cultivating potatoes) and supervises personally all other work on the farm.

He takes two crops of potatoes in a year. The first, the autumn crop, he sows in the middle of September and harvests it in the third week of November. He puts all his 26 acres under the autumn potatoes.

Like potatoes, other crops too receive his close attention . . .

. . . right from the time they are sown till they are harvested and graded for marketing

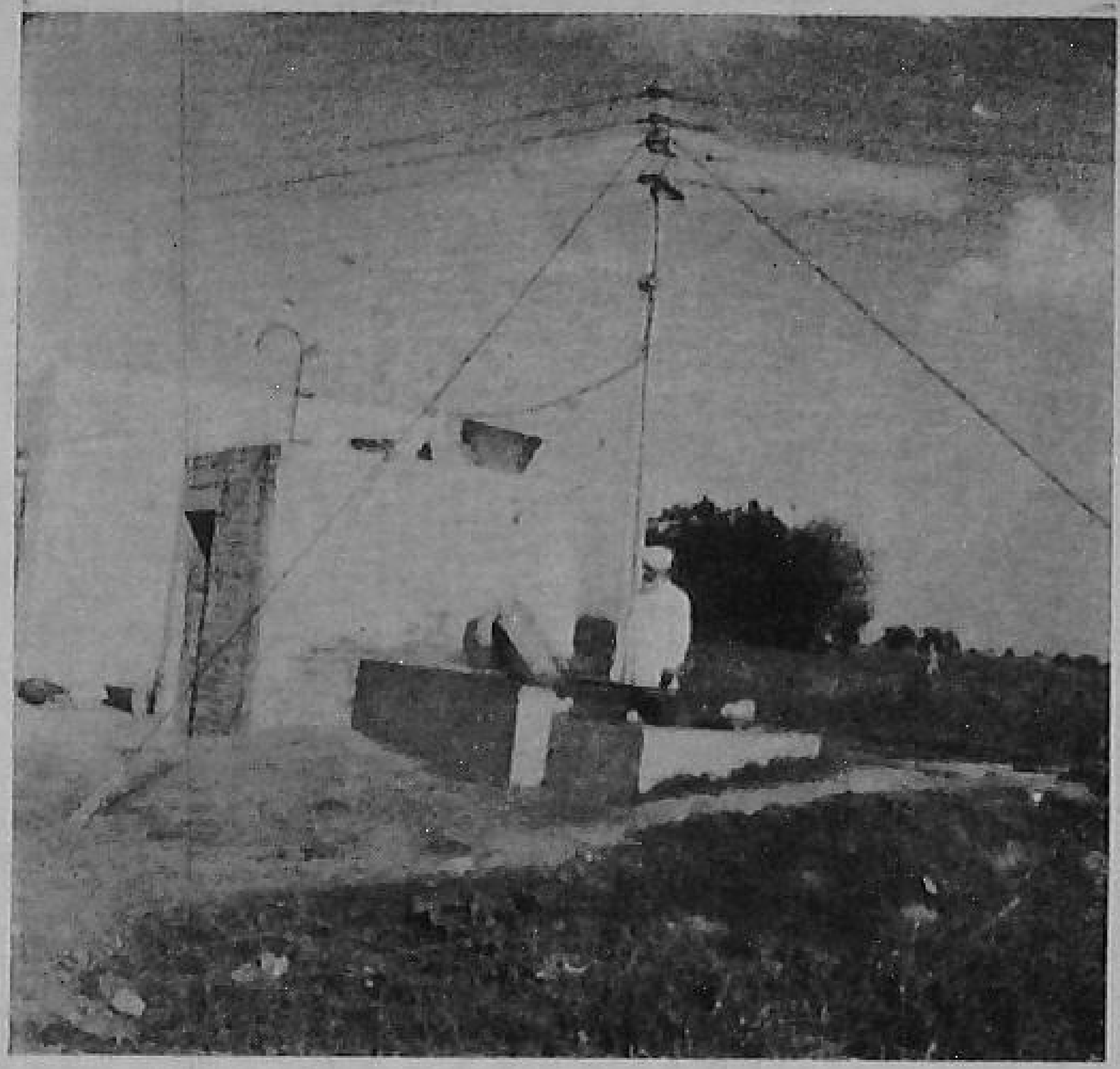
The second, spring crop of potato, is grown on 13 acres. He sows the crop in the first week of January and harvests in the beginning of May. The rest of the area he puts under tomatoes, brinjals and other vegetables.

For potato, he ploughs his field with the tractor, and then planks it. He uses self-grown seed of *Darjeeling Red Round* and *Military Special* varieties at the rate of 18 to 20 maunds per acre. He sows only selected sprouted seed potatoes 1¼ to 1½ inches in diameter on ridges 1½ to 1¾ feet apart with a spacing of 6 to 9 inches.

Gurmukh Singh gives a basal dressing of 16 cartloads of compost per acre if he has not green manured his fields. If, however, he has not applied compost he uses 200 pounds of superphosphate per acre. He then drills or broadcasts 225 pounds of ammonium sulphate at the time the crop is sown. For the early varieties he uses potassium sulphate also which he drills at the time of sowing. He applies another 225 pounds of ammonium sulphate as top-dressing at the time of earthing up when the plants are nine inches high. He hoes the crop whenever necessary.

Gurmukh Singh gives the first irrigation immediately after sowing the crop, and irrigates after every 10 days or so, if there are no rains. In all he gives 10 to 12 irrigations, taking care to see that the ridges are not flooded. He finds his tubewell (he had a *rahet* when he was growing berseem) very helpful in this.

To protect his crop from insects and pests, he sprays 0.1 per cent DDT or 0.02 per cent 'Endrin' twice. The first spray he gives immediately after the germination of the crop, and the second 15 days later. In the case of *Darjeeling Red Round*, which is a late variety, he gives a third spray too. He gives two sprayings of Bordeaux mixture to prevent the attack of late blight.



The tubewell on his farm, helps him irrigate his crops in time

He harvests on an average 250 maunds of potatoes per acre.

OTHER VEGETABLES

Gurmukh Singh transplants the brinjal and tomato seedlings after they are five weeks old. He adopts a spacing of 3½ feet by 1½ feet for tomato and 2 feet by 1½ feet for brinjals. He manures the field with 30 cartloads of compost and 250 pounds of ammonium sulphate per acre.

Gurmukh Singh is very careful about grading his produce before marketing, which, he says, pays him well. Since his farm is only about three miles away from Ludhiana, he is able to send fresh vegetables to the market every day.

Last year he sold farm produce worth 70,000 rupees, to grow which he had spent 35,000 rupees. He could thus earn a net profit of 35,000 rupees.

A NEW MANGO TREE FOR OLD

By P. S. PARSAI

WHEN some of your mango trees get old and start giving poor yields, or start producing poor quality fruits, don't cut them off. Give them a new life by top-working them.

By top-working, you can also turn the inferior trees into superior ones. You also top-work to replace the damaged branches of a tree.

For top-working, you can adopt crown-grafting, side-grafting or budding, or all of them.

The best time for crown-grafting is the rainy season when there is plenty of humidity in the air. Better do the budding in spring in the plains and in the summer months in the hills. In the plains, budding gives equally good results in June, especially if it is done after a good pre-monsoon shower.

Here are some hints on top-working the mango trees.

Select the trees which yield small and stony fruits, containing very little juice or juice of unpleasant taste or flavour.

Also mark the trees known for their high yields, quality fruits and resistance to pests and diseases.

Cut the branches of the trees to be top-worked. The height at which the branches should be cut will depend on the size of the trees. Small trees which have not started bearing can be cut at a height of nearly four to five feet from ground level. On big, fruiting trees, cut branches from the places where the tree is six to nine inches in diameter. In the case of fruiting trees, take care to keep some lateral branches nearest to the ground. These will serve as nurse limbs and provide shade to the trunk. You can remove these branches after a few years when the new variety (or varieties) used for top-working develops enough crown.

BUD-WOOD SELECTION

For crown and side-grafting, select shoots of six to nine inches in length from terminal mature shoots of the current season's growth. If, however, the length of of the current year's growth is not enough, add previous year's growth.

But for budding use shoots from the current year's growth only. Such shoots will be found on young vigorous trees. To induce growth of such shoots on old and poor trees, prune one or more branches of these trees a few months earlier to shoot selection.

Next, remove the leaves from the selected shoots with the help of secateurs, leaving the petioles attached to shoots. Do this about 10 to 15 days before you actually need the shoots for grafting or budding. During this period the petioles that were left will drop down and thus the shoots will be without any leaves, ready for use.

For grafting, use the shoots in which the apical buds have swollen but have not actually started growing. The shoots in which the apical buds are found in an actual growth stage are not suitable for grafting. Such shoots, however, can be used for budding.

CROWN-GRAFTING

If you are following crown-grafting method for top-working, do it immediately after the trunk or the branch is cut.

With the point of a strong knife, make two vertical cuts at a distance of half an inch to one inch starting from the cut surface downwards to a length of three to four inches. This way the bark will be completely cut.

Separate out the bark from the wood (by inserting the ebony end of a budding knife or some other pointed material between the bark and the wood), but put it back in its original position.

Next, make two slanting cuts in the bud-wood, one about three to four inches and the other about half an inch to one inch in length to give a wedge shape. See that you make the cuts, even the longer one, in one stroke only. It is important.

Then insert the wedge between the bark and the wood keeping the longer surface pointing inwards.

Two, three or more grafts can be made this way, depending on the thickness of the trunk or branch.

Tie the grafts firmly but not very tightly with a string used for stitching gunny bags. Cover the cut surfaces with grafting wax (prepared by boiling together three parts of resin, two parts beeswax and one part cocount or linseed oil). Apply the wax when it is just warm and not very hot.

SIDE-GRAFTING

In case of side-grafting, for separating the bark from the wood and for inserting the grafts in the sides of the trunk or branches, make the two verticle cuts in the bark and join them by a third horizontal cut on the upper side. In thic branches and trunk where it is difficult to insert any pointed material for lifting the bark, remove a triangular patch of bark above the horizontal

A top-worked mango tree will bear as well as a new tree

cut. You put back this patch after you insert the bud-wood.

Trim the one end of the bud-shoot into a wedge shape and push it between the bark and the wood.

BUDDING

Budding is done on new shoots that grow from the pollarded trunks and branches. It should be done quite close to the trunks and branches, and taken up as soon as the shoots are mature. There will be many shoots growing from the pollarded branches but do the budding only on some selected ones which are properly spaced. Rub off the remaining shoots as soon as they appear.

Make one vertical cut on the bark of the shoot and loosen the bark with the ebony end of the budding knife.

Remove shield-shaped buds without wood from the defoliated bud-shoots and insert in-between the bark and the wood. Use a tape (prepared by passing strips of cloth through a hot mixture of melted paraffin and resin—mixed in proportion of 3 to 1) for tying the buds.

To get best results, use bud sticks soon after they are removed from the parent trees. You can, however, store for two to three days in damp gunny pieces or in polythene film.

AFTER-CARE

Whatever method you have taken up for top-working, follow up with these after-cares:

Usually, crown and side-grafts grow very vigorously. Protect these by providing supports, from being blown away by storms.

Remove the string used for tying when you find the same is girdling the graft union.

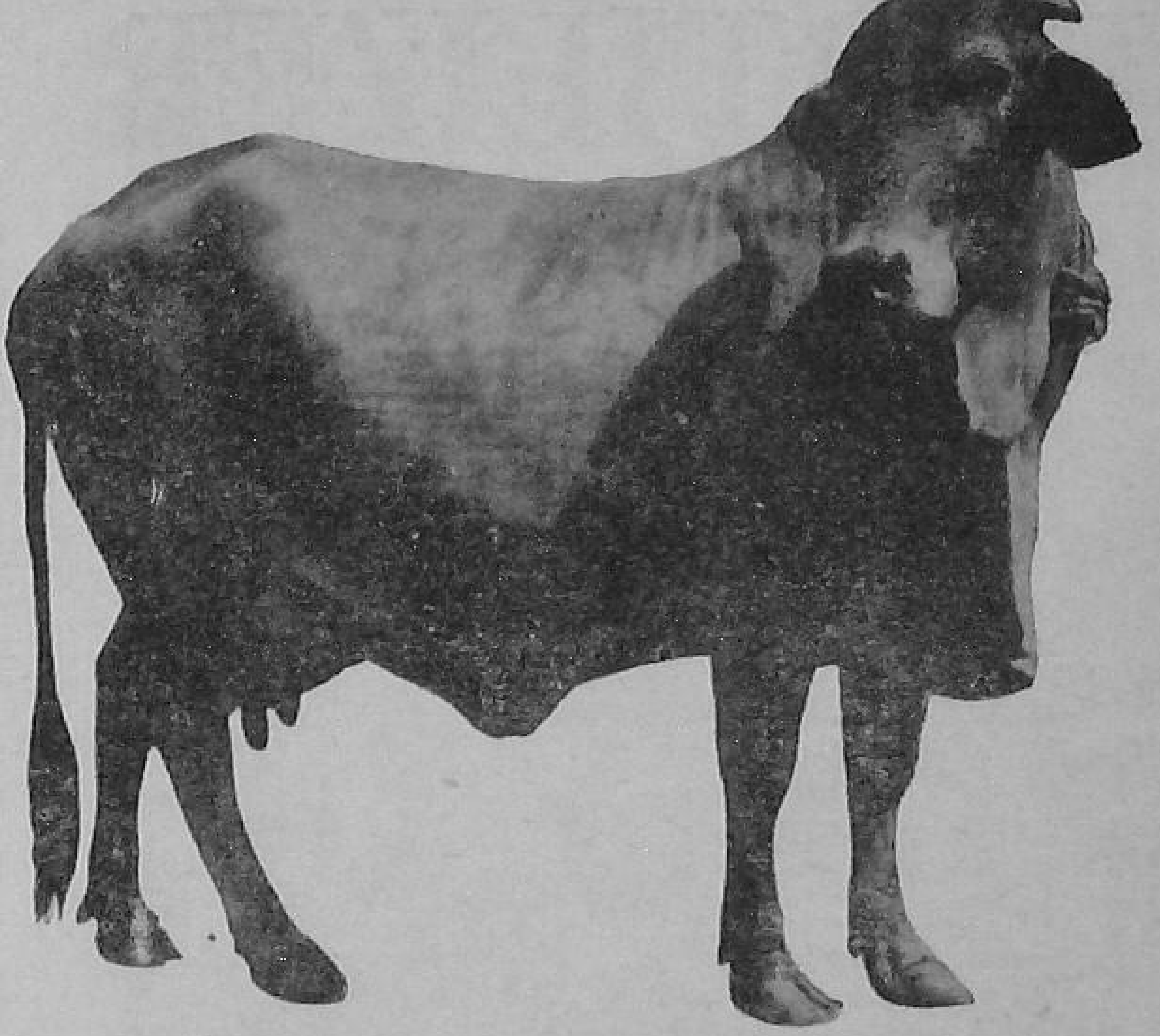
Provide a shade during summer on the south-west side to protect the bark from scalding.

Keep a watch on the appearance of stem-borer, which you can find out by the presence of sawdust-like powder on the ground. Search out the grubs by peeling off the bark, and kill. If you find holes in the wood it means the grubs have already entered the wood. Use diesel oil or petrol to destroy them.

When a thick branch is cut, it takes many years for the new bark to cover the cut surface. The central portion of the wood may start rotting, making trunks and branches hollow. This shortens a tree's life. Prevent this by covering the cut surface with a plaster (prepared by mixing three parts of sand and one part of cement) during the rainy season.

THIS IS THE SPECIAL CARE
the pregnant cow needs

By HARBANS SINGH



ANIMALS need special care, especially during the last few months of pregnancy. You know that the average pregnancy period of a cow is 280 days. Discontinue milking the pregnant cow about six to eight weeks before the expected date of her calving. This will give her necessary rest and will enable her to produce more milk after calving.

Always treat the pregnant animal kindly and with sympathy and never excite her. Don't make her walk long distances, run fast, get frightened or allow to fight with other animals. Observe regular hours of feeding and grazing.

House your cow comfortably and protect her from extremes of climate. Don't allow her to mix, or tie her with animals that have aborted.

A week before the cow is expected to calve, house her separately from the rest of the herd.

Watch the cow carefully as the calving time approaches. Generally, you will see the following symptoms in her.

- Appetite is lost or reduced.
- Udder is increased in size.
- The genital opening is congested and enlarged.
- Yellowish mucous comes out of the genital opening.
- The animal urinates frequently in small quantities.
- Depressions appear near the pin bones.
- The animal shows signs of restlessness, by frequently waving the tail and by lying down and standing up at short intervals.
- The animal tries to be away from others.

Before calving, give her a light and easy-to-digest food. After calving, bring her to normal rations gradually in ten to twelve days. Make a salt-lick available to the pregnant cow, so that she might lick it when she desires. You may instead, add a chhatack of salt to the daily ration. Provide her with a bed of clean straw.

During the act of calving, allow nature to have its own course. Do not interfere. If the cow has any difficulty, get a veterinary surgeon or an expert herdsman to help her out.

Give a warm bran mash to the cow after she has calved. Allow her to lick the calf. Let the calf get up on its own and run about. A healthy calf should be up in 20 to 30 minutes. If it does not, help it to stand up.

Watch for the falling of of the after-birth. Normally, the after-birth should come out within five to six hours of calving. In case it does not fall within 24 hours, seek the help of a veterinary surgeon.

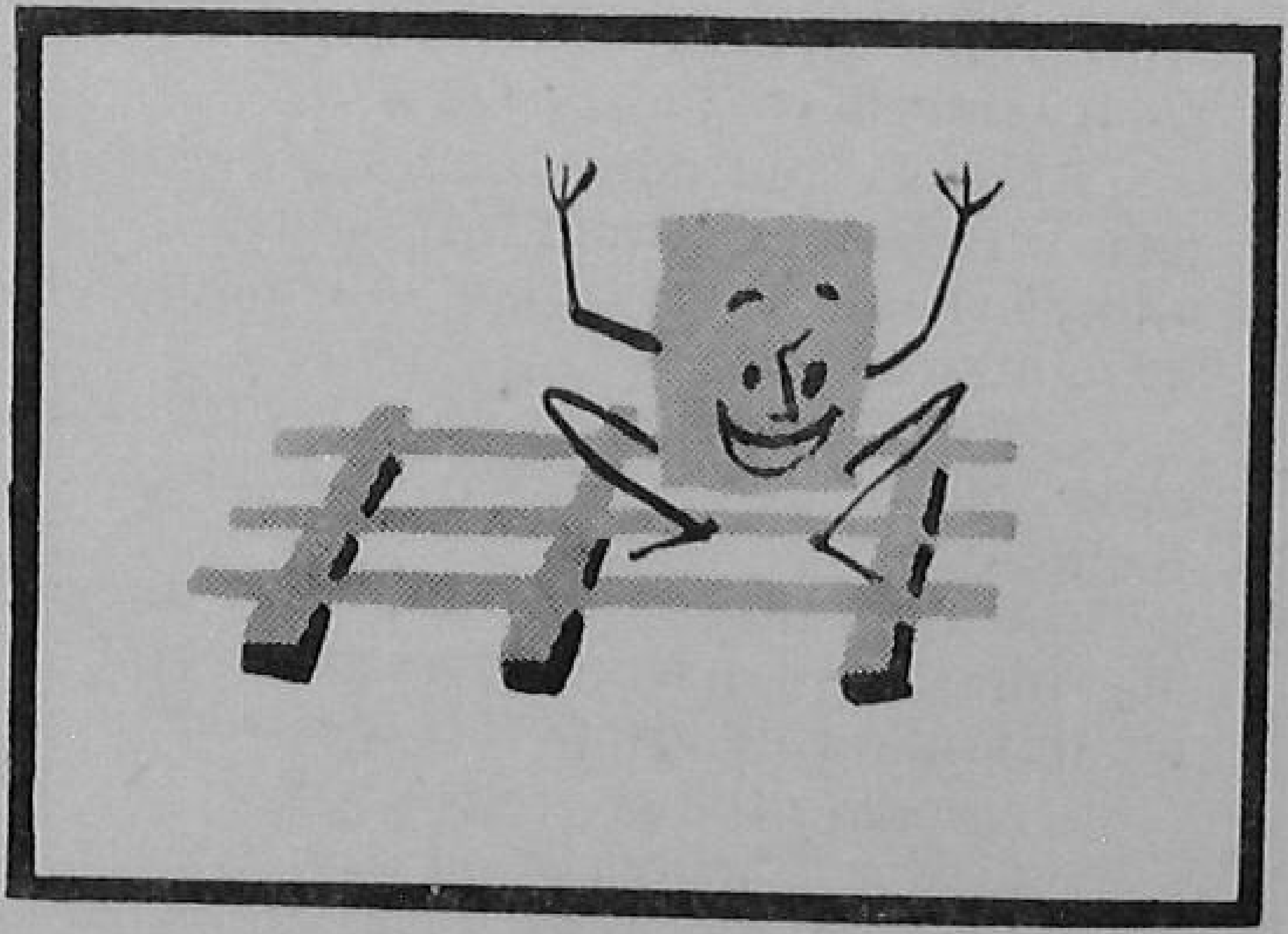
TIPS ON

HOW TO STORE YOUR FERTILIZER

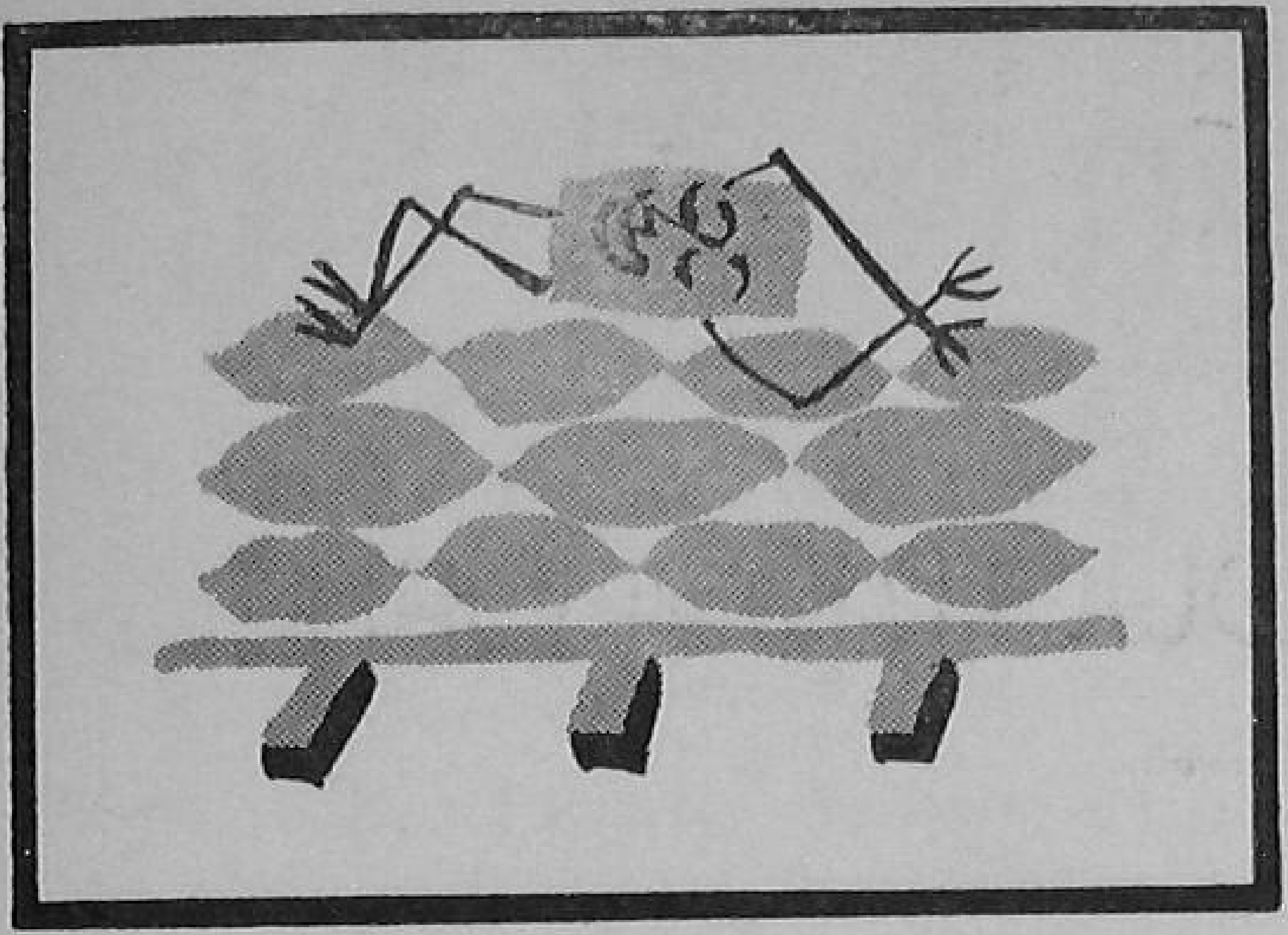
YOU must be buying your fertilizer quite ahead of time so that you may have it readily at hand when you need it.

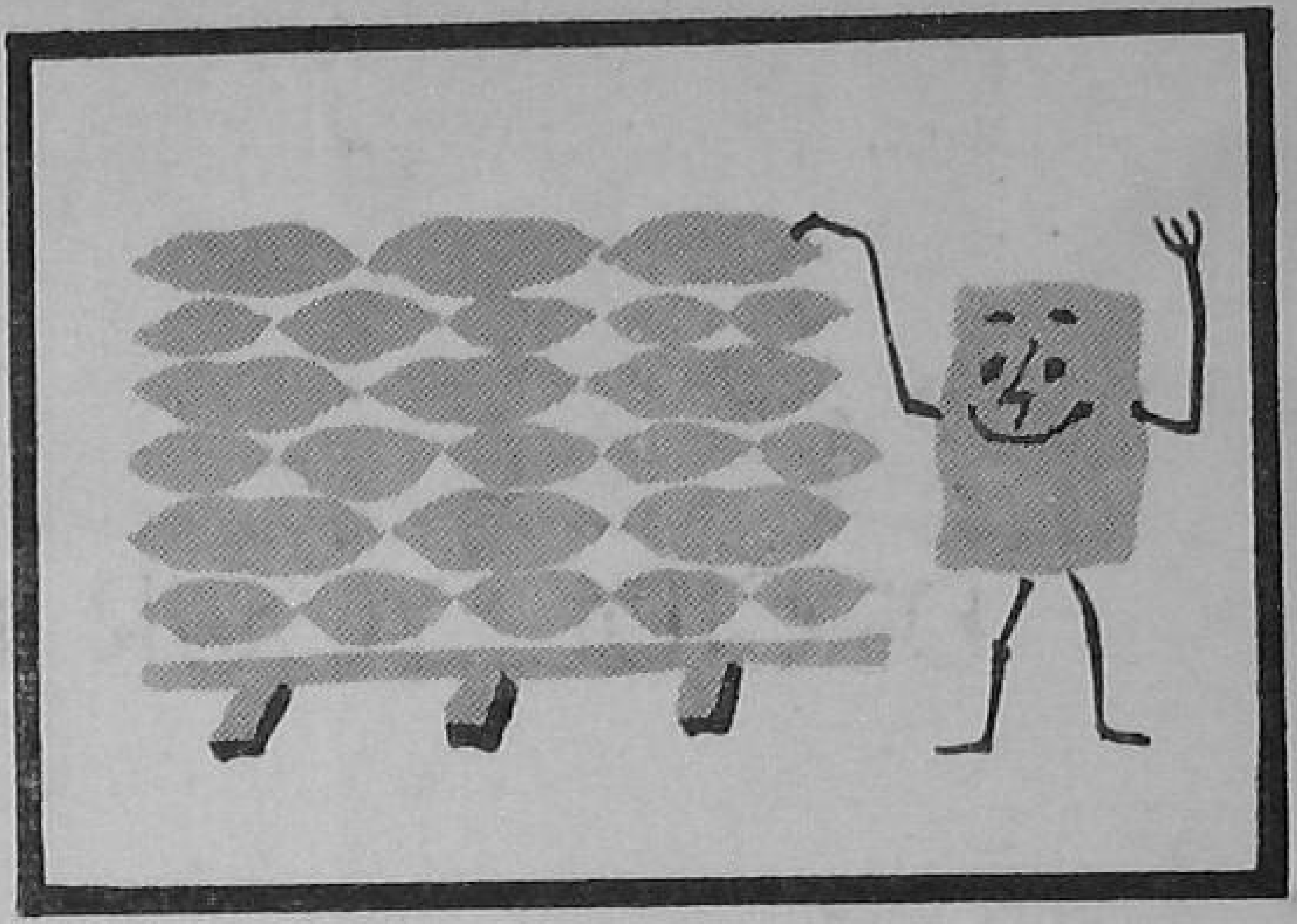
This makes it necessary for you to store your fertilizer. And it is important that you store it carefully so that the plant foods contained in it may not be lost. Here are a few tips on how you can store fertilizer properly.

- Store the fertilizer bags in a dry and leak-proof godown. Otherwise, the rain water will soak the bags and the fertilizer will get wet. As a result, the bags will break, and plant foods will be lost from the fertilizer. Such a fertilizer cannot also be applied to the field properly.



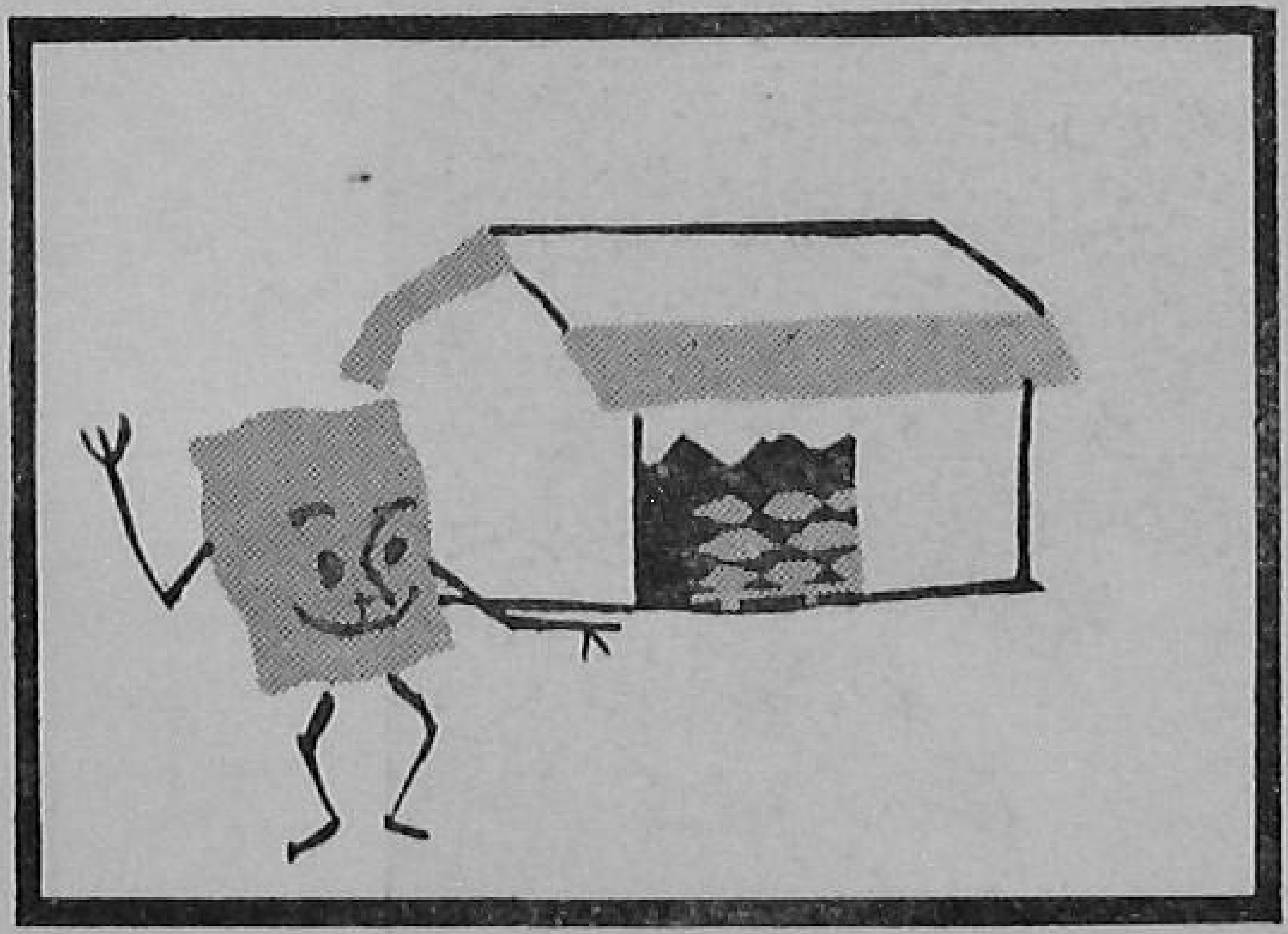
- Keep the fertilizer bags off a damp floor. Such a floor will make the fertilizer pick up moisture. Hence, place bricks, cement blocks or four-square-inche wood pieces about two to three feet apart on the floor. Over this, lay wooden battens or bamboo poles in the opposite direction, thus giving a space between the bags and the floor.

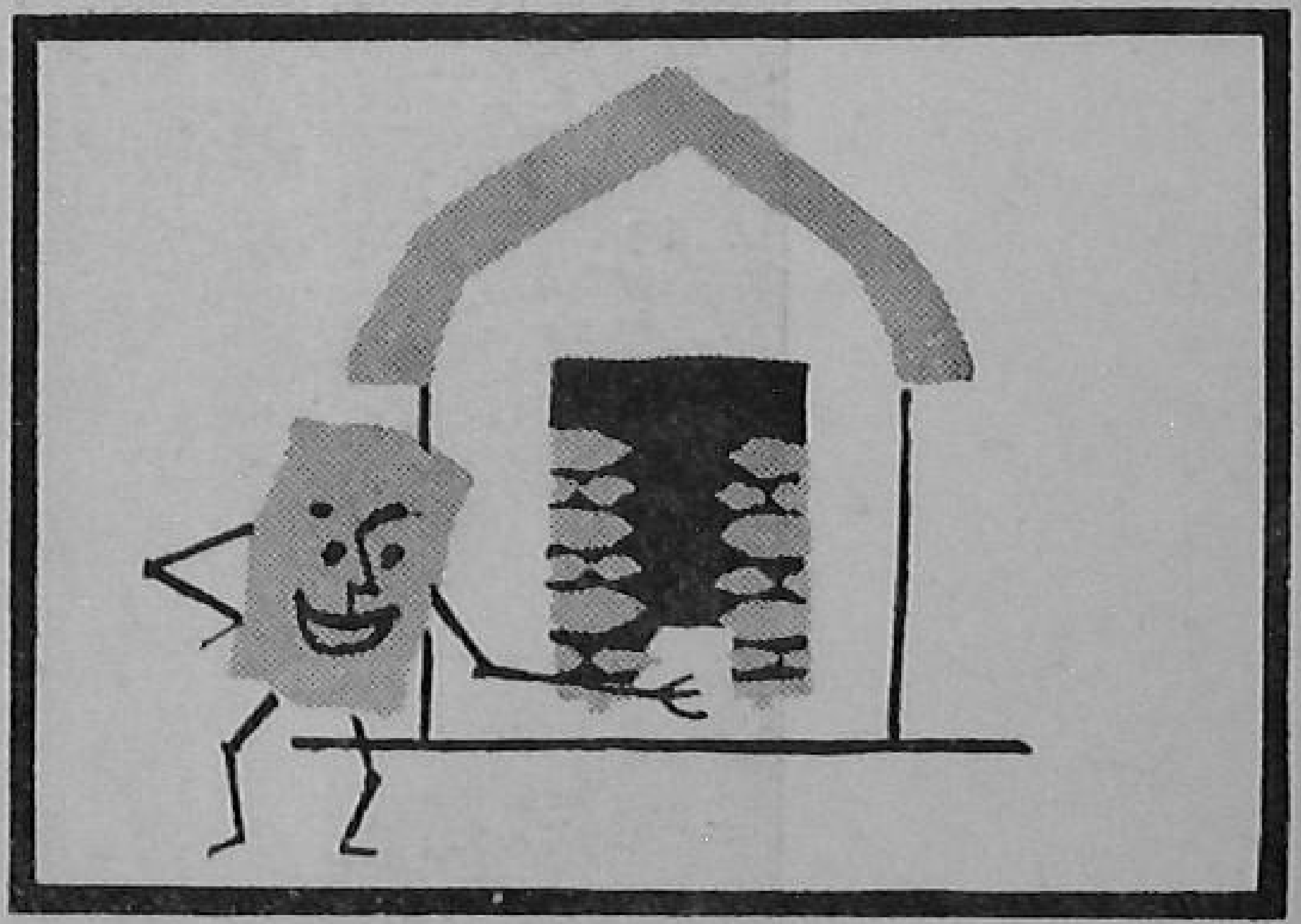




• Lay the bags crosswise. This will be the first layer. Pile the bags lengthwise over this layer. Go on piling till the stack is about eight feet high.

• But do not pile higher than eight feet. If you pile the bags too high, the bags at the bottom may set hard. The pressure on the lower bags causes the fertilizer particles to cake together.





• Give the fertilizer air-space on all sides of the stack. When this is done, your fertilizer will keep well.

• You should store the bags in such a way that these are within easy reach.

Store the fertilizer this way and it will keep fresh and good.

DISEASES DECIDE YOUR POULTRY PROFITS

By S. G. IYER

EVEN when you rear poultry under the best conditions, you will have to watch out for diseases that may break out at any time. These poultry diseases many a time decide whether you make profits or incur losses in your poultry business.

Fortunately, research has now made it possible to control most poultry diseases.

Whenever you find birds suddenly start dying in large numbers, the best thing to do is to get the diseases correctly diagnosed by

Feeding the birds right ration is one good way of keeping the diseases off the poultry flock

the local veterinary officer and to take necessary steps to control the same.

The most dangerous of the contagious diseases of fowls in India are Ranikhet and fowl pox. You can get your birds inoculated for these diseases free of cost. Every chicken should be inoculated against these diseases when it is between four and eight weeks of age.

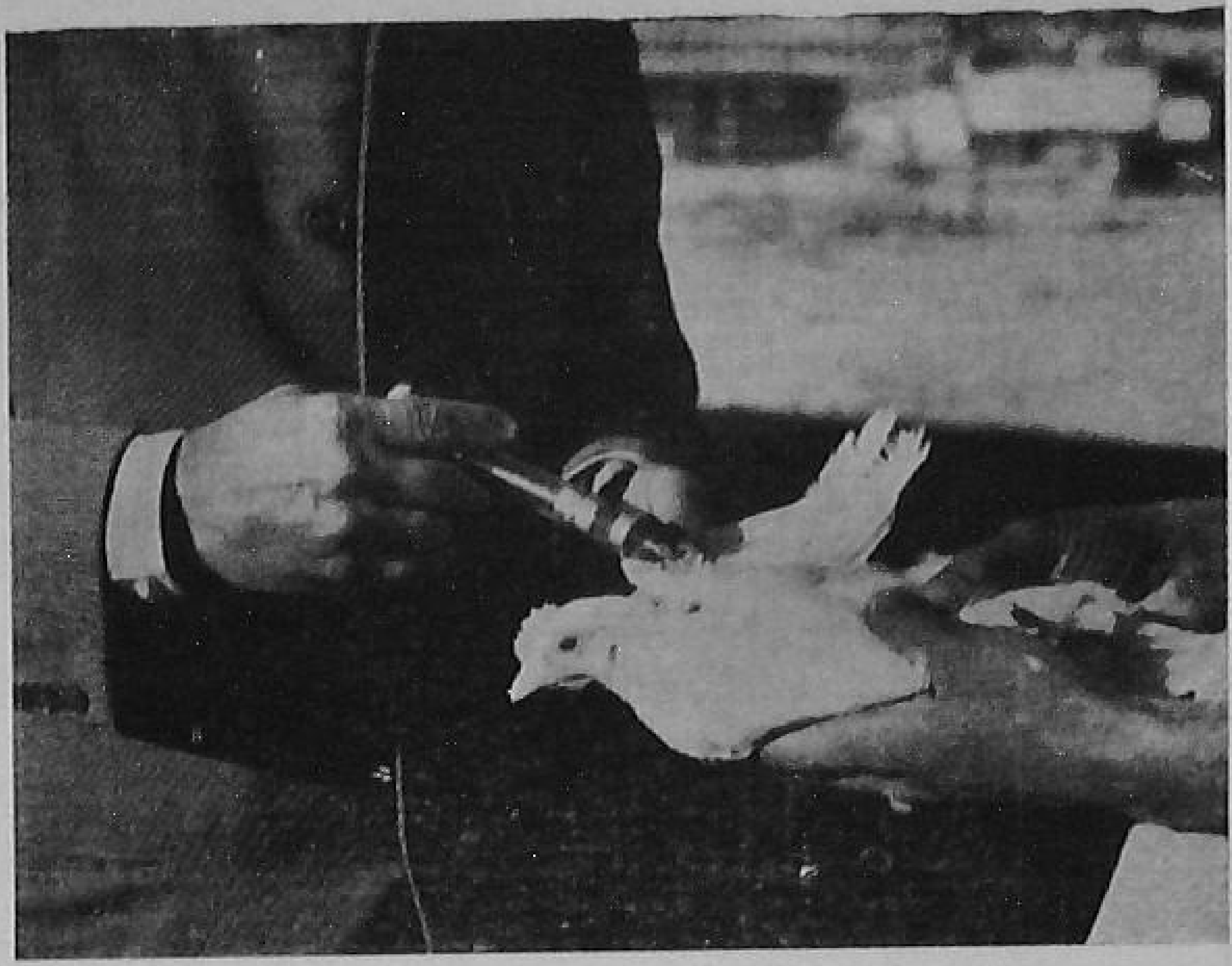
Tick fever and coccidiosis, two more bad diseases, can be treated with success if the medicine is given in time.

The poultry keeper today also finds certain respiratory diseases (often called coryza) a problem. But when the disease is correctly diagnosed, it is possible to cure it with antibiotics. You can consult the Indian Veterinary Research Institute, Izatnagar, in this regard.

For successful poultry keeping, a high quality breeding stock, proper housing, management, feeding, hygiene and the detection of diseases amongst birds and checking their spread are all important.

By proper breeding it is possible to raise fowls which can resist diseases to a great extent. You should always get a sound foundation stock from government poultry farms.

Many poultry troubles are due to defective feeding. Birds grow rapidly and need a good diet for growth and production. The poultry diet will be complete only when it is balanced and contains all the essential nutrients in a proper proportion—proteins, carbohydrates, fats, minerals and vitamins. It is advisable to obtain a ready-to-feed mash from a government poultry farm or from a good dealer who prepares this under government guidance.



Vaccination is another way of preventing contagious diseases

The feeding of green food will often prevent many deficiencies. The use of calcium will help build up the bones in the growing chick and for egg shell formation in the laying bird. Synthetic Vitamins A, B2 and D3 are now available in the market, and many poultry keepers have had excellent results by using these in the poultry feed. Also these are quite cheap and can safely be used, instead of greens, separately with other foods like shark-liver oil added to the ration.

Poultry-houses must be dry, have moderate temperature, proper ventilation, no draughts, abundance of light and adequate floor space.

However, prevention is always better than cure.

When a contagious disease breaks out, remove healthy fowls immediately and keep them separate. You should take care to see that the persons working with the infected birds do not carry the infection on their shoes, clothing and hands and thus pass it on to the healthy birds.

Flying birds can easily spread a number of contagious diseases, and, hence, keep these out as far as possible. Remove dead poultry birds immediately and bury them. Droppings of affected birds heavily infect the soil. It is, therefore, necessary that you dig up or plough the soil in poultry pens, exposing it to the sun, and apply ground lime at two tons per acre. Wherever possible leave infected land vacant for six months or put the same under crops for a season before allowing the birds on it.

Poultry droppings are a good manure, but when there is any contagious disease present all the excreta from the poultry house and run should be removed and burnt.

Have the feed-hoppers so made that the mash within it does not get mixed up with the droppings.

Water is frequently the source of a number of troubles, and hence take to the fountain method of watering fowls.

It is better to preserve the health of a flock as a whole than try to save one or two birds by treatment when they are suffering from infectious diseases.

Remember the following for disease prevention.

1. Keep all newly purchased birds isolated for two weeks.
2. Bury or burn the offals and feathers of chickens used for table.
3. Raise young stock on a clean ground, separate from the older birds.
4. Do not allow visitors to enter poultry-houses and runs.
5. Use clean feeding and watering utensils.
6. Provide adequate drainage and avoid dampness.
7. Feed your birds with the right ration.
8. Keep a watch on ticks in the poultry-house which are the worst enemy of chickens and get rid of them immediately by dusting an insecticide or by treating the houses.
9. Vaccinate all chickens against Ranikhet and fowl pox, as a routine.
10. In the case of an outbreak of an infectious disease, promptly inform the nearest veterinary hospital or the Block Development Officer and confine your birds inside the house till the doctor arrives.

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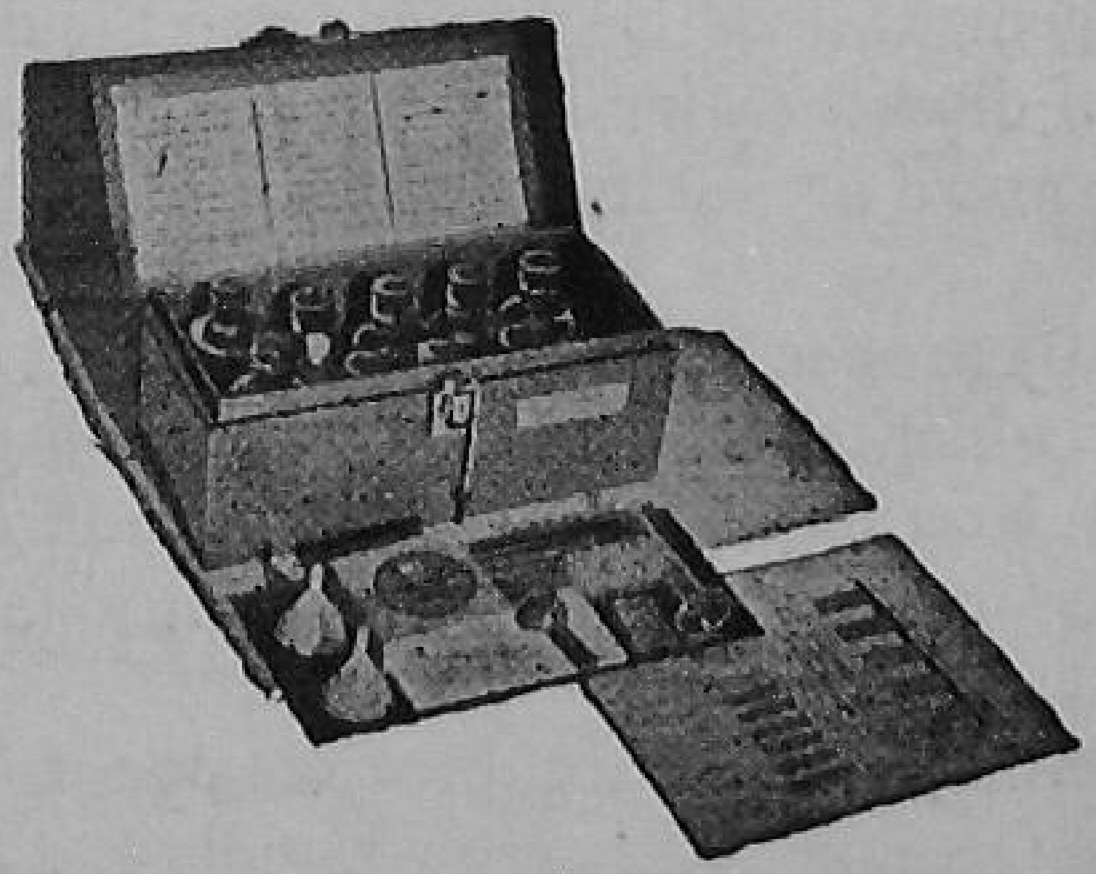

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CONTROL THE CASTOR SEMILOOPER

AT a cost of less than 11 rupees an acre, you can control the semilooper, one of the worst pests of the castor crop.

The pest is called semilooper because it walks in loops. It is about 1½ inches long, ash grey to dark grey in colour when fully grown, and has two or three longitudinal stripes or bands on its back.

It feeds on the leaves, tender stems, blossoms and even on the tender fruits of the castor plant. When the attack is severe, it leaves behind only the skeletons of leaves. The castor semilooper generally appears in August, and continues to damage the crop till November. It does the worst damage in September-October.

Recent experiments in Hyderabad have shown that the pest can be completely controlled by using 'Endrin.' An ounce of this chemical is mixed in four gallons of water and sprayed on the crop. The first spraying is given in August, when 12 ounces of the chemical should be used per acre. This will cost Rs. 4.31. The second spraying is given after a month, using a pound of 'Endrin,' costing Rs. 6.44. With these two sprayings of Rs. 10.75 worth of the chemical per acre, you can completey control the semilooper and save the valuable castor crop.

By L. VENKATARATNAM

PLANTING TREES THIS MONSOON ?

DURING this rainy season, make it a point to raise trees for shade or decoration on your farm. Select these trees with care so that they may grow well and safe. Bear these points in mind in selecting the trees for your farm.

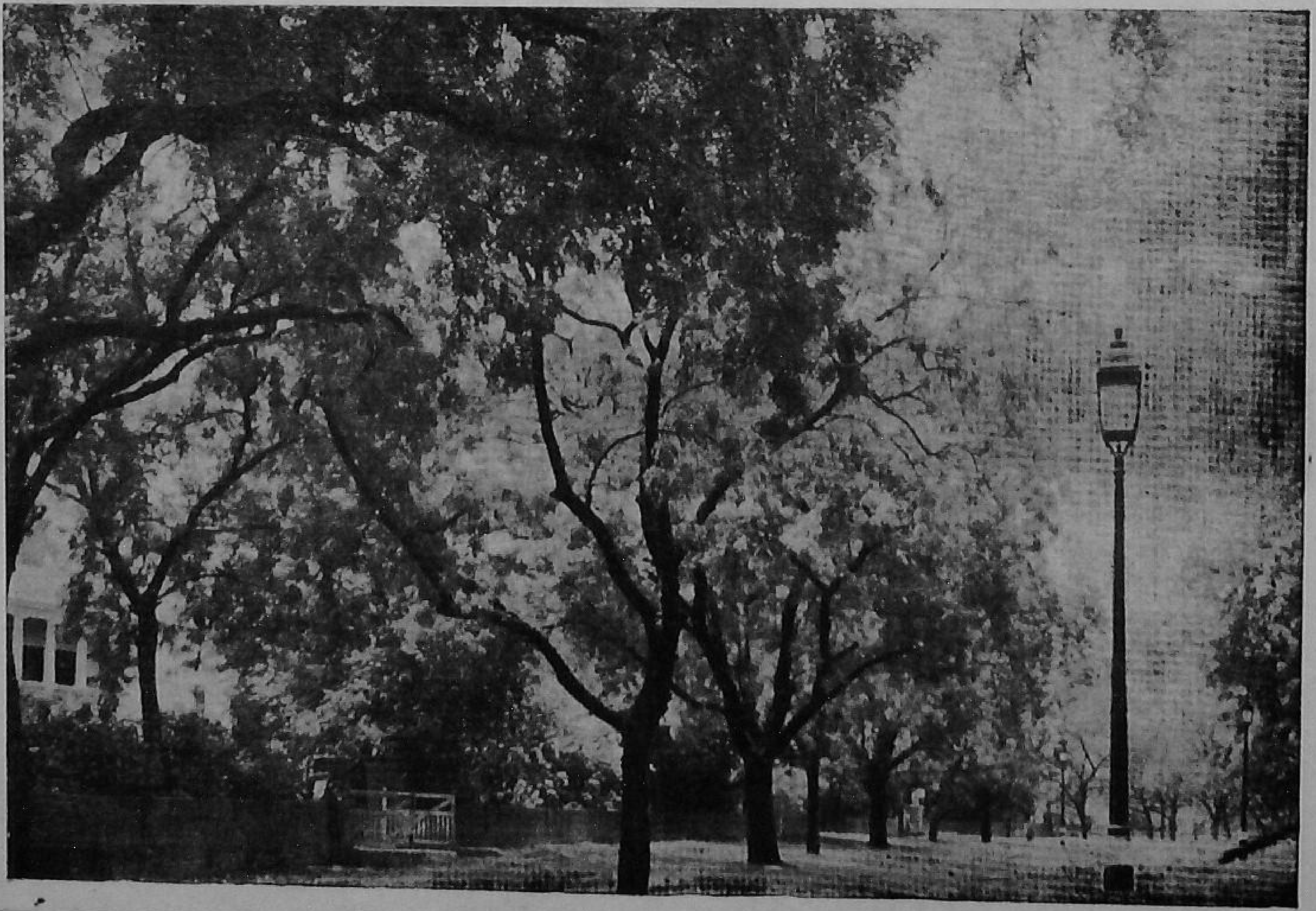
- Raise quick-growing trees which have no soft trunks easily broken by winds, dust-storms, etc.
- Select trees which are deep rooted; such trees can stand drought in summer and stagnation of water in the rainy season.
- Select trees which do not have pests and diseases attacking them. These may attack the crops in your fields too.
- Select trees that do not shed leaves completely in the year (like Gulmohar).
- Select trees which are not liked by goats or stray animals, otherwise they will eat away the foliage.

These are rather tough conditions, but there are a number of trees which fulfil many of these conditions.

Here is a list of such trees grouped together according to the height they attain when they are full-grown.

LOW-SPREADING TREES (10 TO 15 FEET HIGH)

The Cassias belong to this group. These are very good for planting in villages. Their leaves are not liked by goats and they



Cassia nodosa

Cassia fistula (Amaltas)

bear colourful flowers which add to the beauty of the landscape.

The cassias which can be commonly sown are *Cassia fistula* (*Amaltas*), *Cassia renigera* (Burmese cassia), *Cassia nodosa* (the Pink Mohor), *Cassia javanica* (Java cassia), and *Cassia auriculata*. *Butea frondosa* (*Palas*), and Bauhinias belonging to this group are equally good.

The seeds of all these trees have a hard coat on them, and hence soak them in boiling water at least for five minutes before sowing them in the nursery.

MEDIUM-SPREADING TREES (20 TO 25 FEET HIGH

The *neem* or margosa (*Melia azadiracta*) belonging to this group is commonly grown all over the country. The tree provides very good shade and is free from the stray animal nuisance. *Neem* leaf is a good green manure, and *neem* seed oil is used in industry. *Neem* cake is a very good manure too. Besides, the *neem* has many medicinal properties.

The *shisham* (*Dalbergia sissoo*) belonging to this group also provides good shade and is extensively planted in the Punjab as wind-breaks, shelter-belts, etc.

Ornamental trees in this group are *Peltoforum ferrugineum* (the rusty shield bearer) which gives beautiful golden flowers and *Polyalthia longifolia* (Asoka) and *Celophyllum inophyllum* which have decorative leaves.

LARGE, SPREADING TREES (30 TO 40 FEET HIGH)

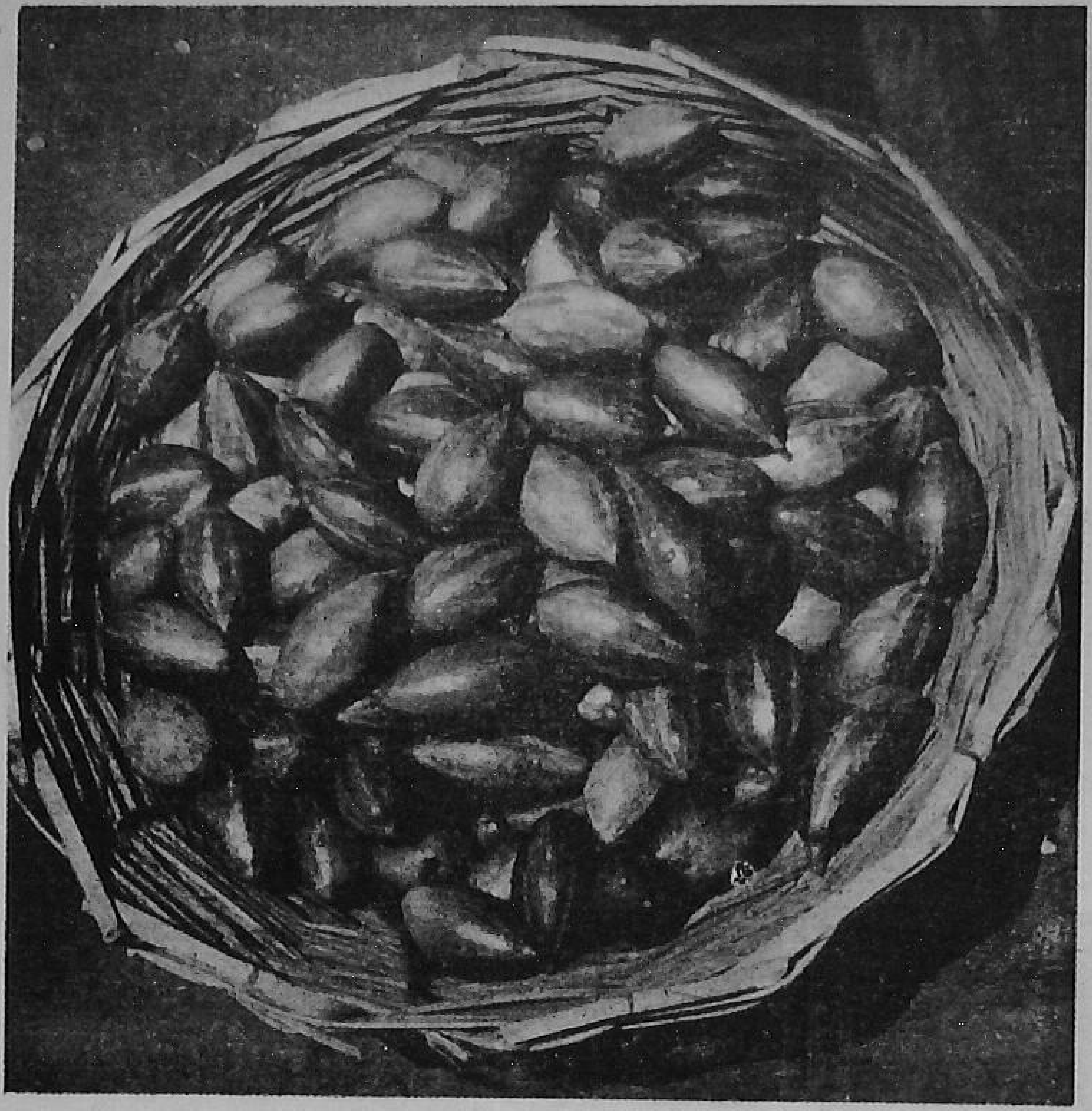
Alstonia scholaris is an excellent tree for large scale planting and belongs to this group. The tree provides good shade. Cattle do not touch this tree.

Tamarind is another tree which is also economically important, and should be planted on a larger scale.

The Indian cork tree (*Melingtonia hortensis*) belonging to this group does not spread, grows tall and gives beautiful white scented flowers. The rain tree (*Enterolobium saman*) grows fast to a big size on the sea coast and in humid regions.

The fountain tree (*Spathodea campanulata*) also belonging to this group grows 70 feet high and bears orange-crimson flowers. It appears very attractive when grown in clusters.

You have now known some of the good and useful trees which you can plant on your farm this rainy season.



YOU SHOULD GROW *parwal* TOO

By R. K. SHUKLA

GROWN properly, there are few vegetables which can get you as much profit as *parwal* can, as many farmers in West Bengal, Bihar, and Uttar Pradesh can tell you.

Green *parwal* fruit has a high food value. A number of tasty dishes and pickles can be prepared from *parwal*. The fruits are also used in various medicinal preparations.

You do not need to grow *parwal* on a large scale if you cannot. Raise a few vines in your kitchen garden to provide fresh fruits for your table.

SOIL AND CLIMATE

Parwal wants warm and humid conditions. A soil sandy loam in texture and having enough of organic matter gives good crops of *parwal*. The soil in which you raise the crop should be well-drained and should neither be saline nor alkaline.

LAND PREPARATION

Apply compost at 200 maunds per acre and mix it well with the soil. Give one ploughing with a soil-turning plough; follow up with another four ploughings with the

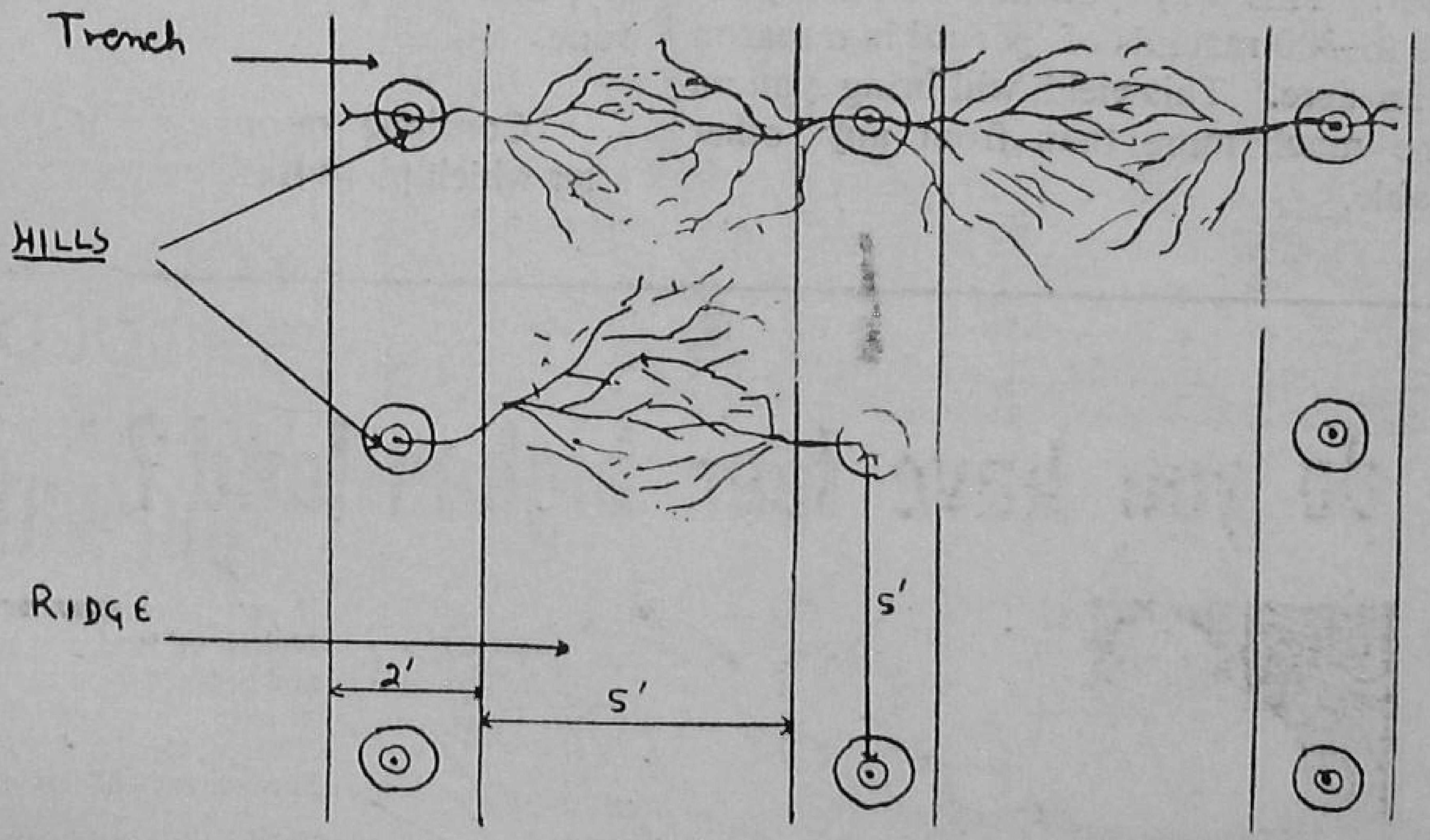
desi plough. Next, dig trenches two feet wide and four inche deep, and five feet apart. In the trenches, prepare hills for planting. Keep the distance between two hills at five feet. However, if you are growing *parwal* in your kitchen gardens prepare hills on plain beds, adopting a closer spacing. Apply half a pound of *neem* cake to each of the hills before planting.

PLANTING

You can raise *parwal* from seed or from stem cuttings. But cuttings are better.

you want to take the cuttings. Remember that you need 95 per cent of the cuttings from female plants and only five per cent from the male plants.

For planting, use three to five feet long cuttings having eight to ten healthy buds in it. Roll the cuttings, leaving about six inches at one end. Plant the rolled cuttings four inches deep in the hills leaving the unrolled portion out. You will need three to five maunds of vine cutting to plant an acre.



A *parwal* plant can be either a male or a female. For good yields, there should be about 94 per cent of female plants and five per cent male plants in a garden. But if you raise from seed, it is quite likely that 50 per cent of the seed sown may turn out to be male, and naturally you will get a smaller yield. It is, therefore, safer to raise your seedlings from cuttings.

For this, mark the plants from which

August to October is the best time for planting.

AFTER-CARE

Cuttings begin to sprout two weeks after planting. Give a light irrigation if the soil is dry. At later stages give irrigations at longer intervals. Once the vines establish, there is no need to water except during summer.

Keep the field free of weeds.

Give one ounce of superphosphate and two ounces of ammonium sulphate to each plant.

In the months of July-August and February-March, apply ten pounds of five per cent BHC (dust) to protect plants from pest attack.

YIELD

The vines planted in July-August will come to bear in April-May and continue till October. This way you can obtain a yield of 200 to 300 maunds of *parwal* in a season from an acre. This yield will bring you an income much more than from any other vegetable.

RATOONING

Parwal, being a perennial crop, yields fruits for several years on the same plant. But it remains dormant during winter when it sheds its leaves, when you should prune the top of the vines.

Also, dig the plot with a spade leaving two feet space around the base of the plant. Prepare hills around the base, and apply three pounds of compost and four ounces of ammonium sulphate per hill.

New flushes appear in January-February, and the plants start bearing in May-June.

Continue ratooning for three years, after which plant fresh cuttings.

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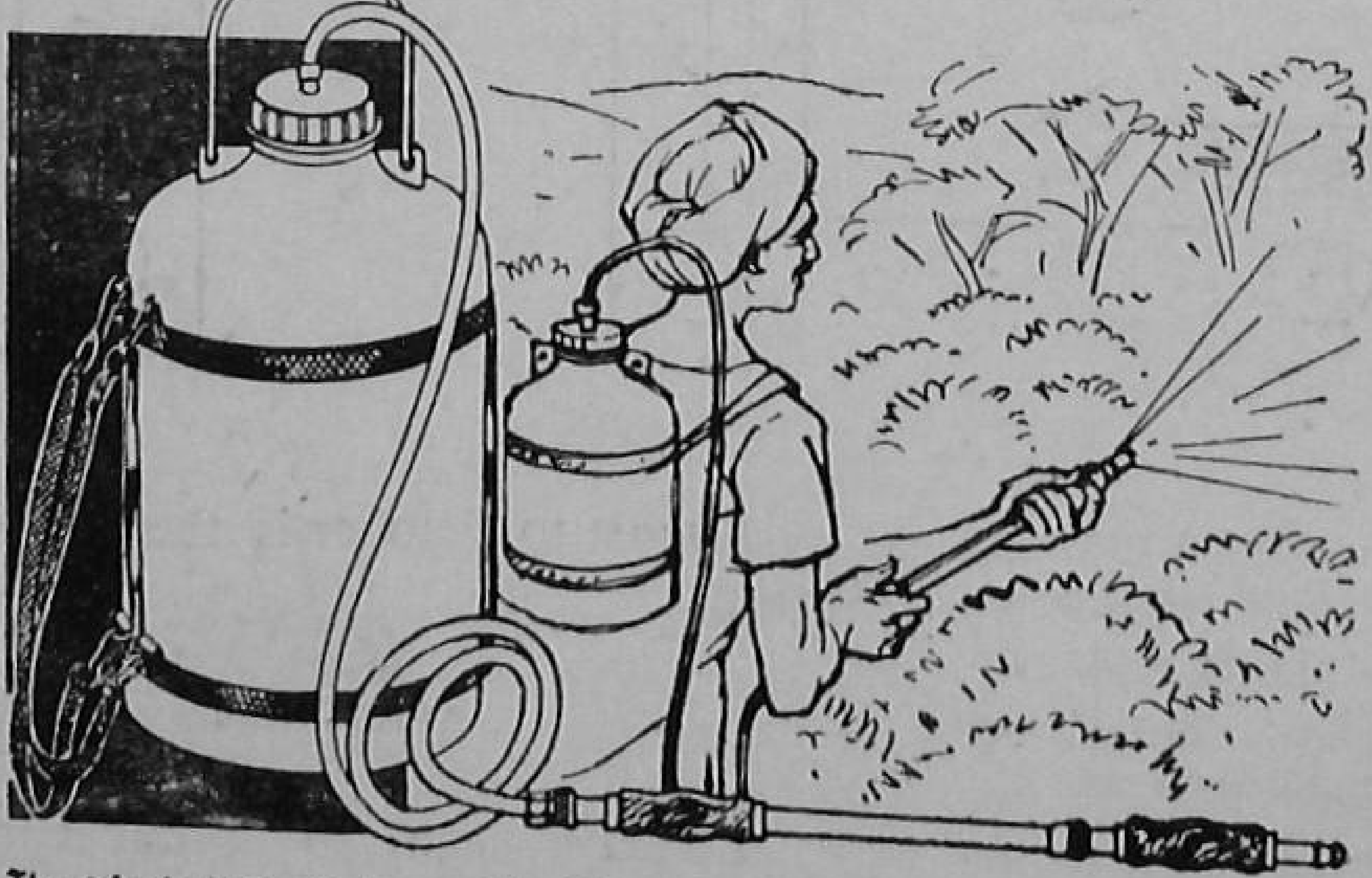
do you have four bighas land?



If you have four or more bighas of land to cultivate and protect from the ravages of pest . . . you will find the *'Holder Harriden'* **"Junior"** Sprayer indispensable.

This cheap continuous action, double-acting hand pump fitted with a 2-ft. Lance Extension, Angle Bend, 3 different nozzles, 4.5 ft. of hose and a 2 gallon light-weight (3 lbs.) plastic container, will soon pay for itself in the form of a healthy and bountiful crop.

The "Junior" Sprayer is one of the 'Holder Harriden' range manufactured by

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SWC-38

TAKE out those garments, sarees, frocks, skirts—which though in good condition you thought you could not use because you or your family members long outgrew them or because they were outsized. You may also have with you garments which are too good to be thrown away. Even if such garments have one or two weak point, you can renovate and remodel them for further use.

Shrimati Kanthimathi Kumar has many such ideas. We would like our readers to share with Shrimati Kumar her many ideas of renovating old garments. Follow the correct measurements and you will have new garments which your friends will admire and compliment you for.

The first one in the series is :

A NEW FROCK FROM AN OLD SKIRT

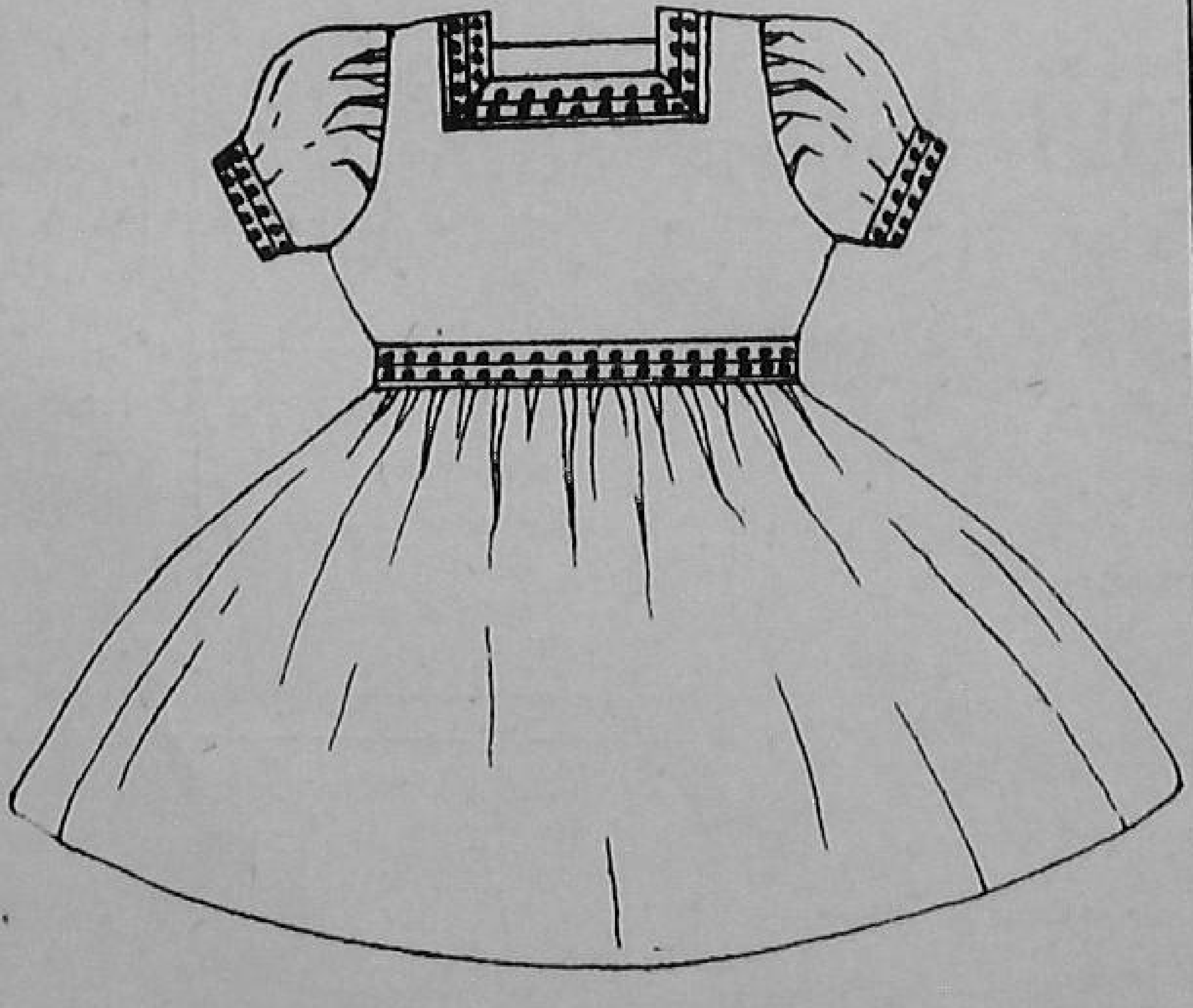


Fig. 1

Fig. 2

You can convert an Indian skirt of a girl (whose chest measures about 22 inches) into a fashionable frock for her.

Measurements of the skirt

Length from waist-line to ankle 30 inches. Full width of the skirt 72 inches. Width of the border 5 inches.

Measurements of the frock

Length 21 inches. Waist length 9 inches. Chest 22 inches. Waist 21 inches. Shoulder width 9 inches. Sleeve length 5½ inches. Sleeve band 8 inches.

HOW TO MAKE THE PATTERN PIECES OF THE FROCK

Note: Key to diagrams

(1) Measurements are given within arrows or with the arrows pointing to the measured length. A few measurements are given with reference to alphabets.

(2) The thin line (__) denotes the edge of the paper taken for pattern-making.

(3) The dash dot line (–·–·–) is used as a guide to draft curves, etc.

(4) The thick line (__) denotes where to cut.

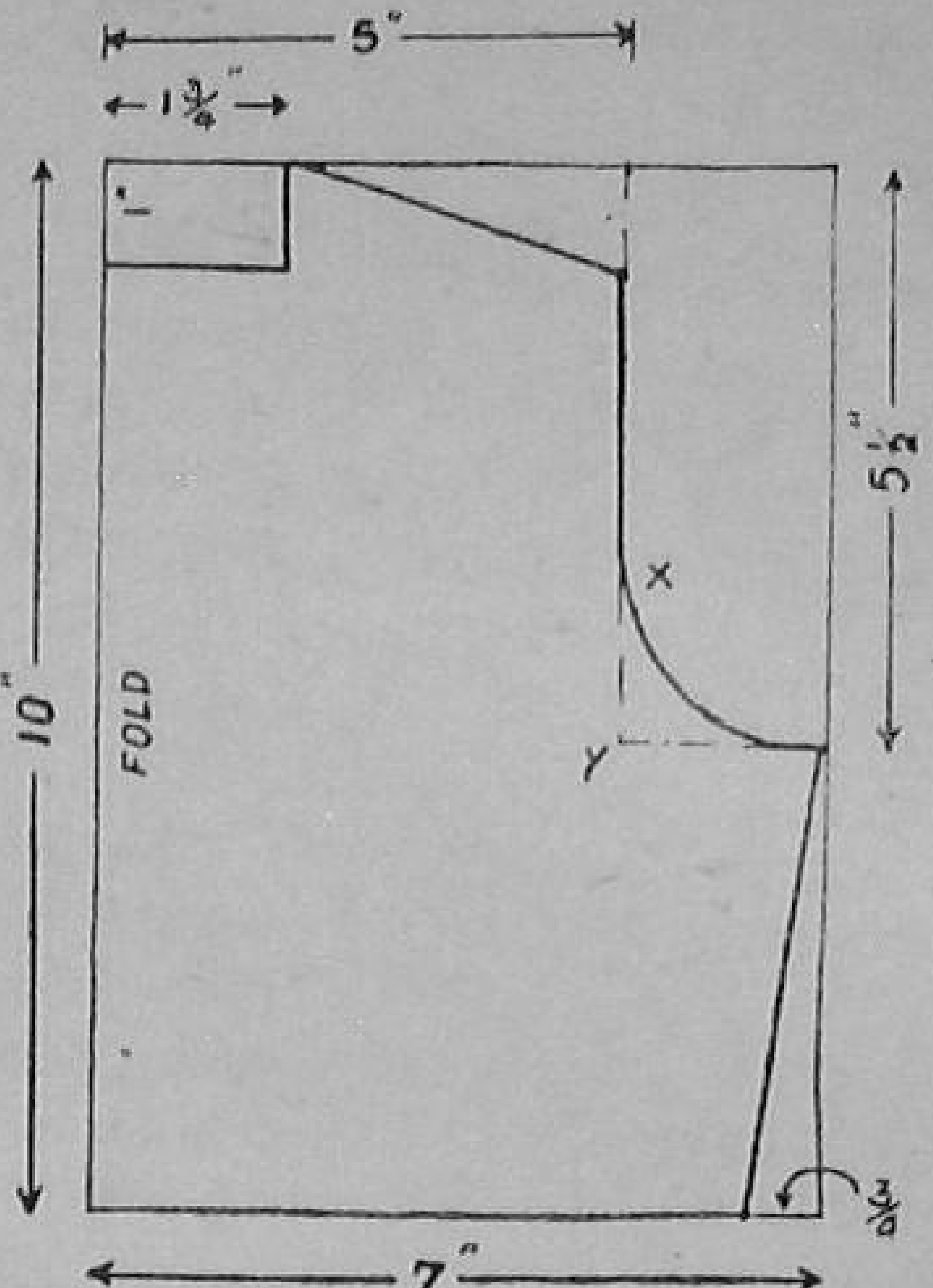
(5) The dotted line (. . .) denotes where to cut after the first cutting is done.

(6) Wherever the word 'fold' occurs, take double the width shown in the diagram and then fold the paper.

Drafting and cutting

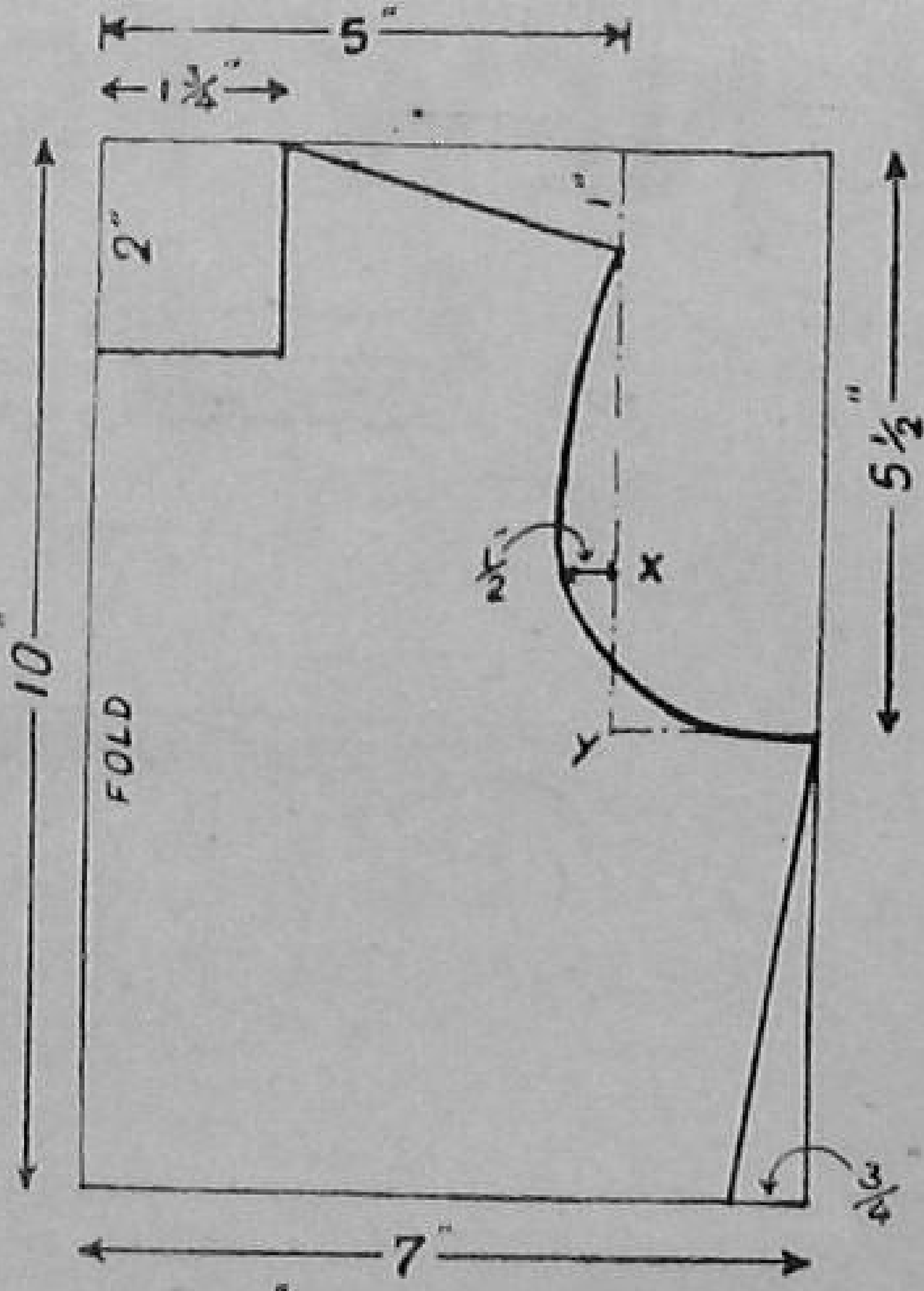
(a) Draft the back and the front of the bodice and the sleeves according to Figures 3, 4 and 5 and cut the patterns along the thick lines.

(b) Open out the fold of the sleeves and cut along the dotted curve on one half of the sleeves only. Prepare two sleeves.



XY · 1½"

Fig. 3 (Construction of back bodice)



XY · 1½"

Fig. 4 (Construction of front bodice)

The portion cut deeper in the sleeve-head is to be attached to the front armhole. Therefore, note that the right sleeve is to be differentiated from the left sleeve.

(c) Cut along the central fold of the back bodice for the back opening.

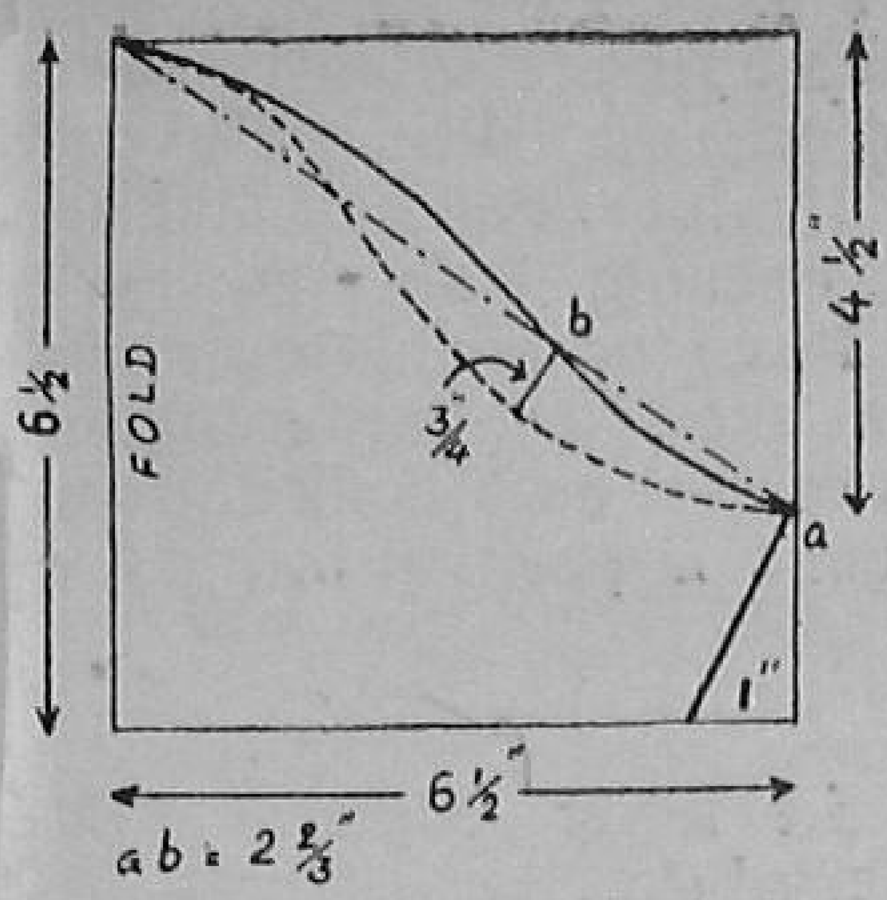


Fig. 5 (Construction of sleeves)

(d) Skirt : For the skirt, take two pieces of paper, one 14½″ wide and 29″ long for the front and the other 14½″ wide and 28″ long for the back.

(e) Sleeve-bands, belt and facing for the neck : For the sleeve-bands, cut two strips of paper, each 9″ long and 1¼″ wide. For the belt, cut a strip 23″ long and 5″ wide. For each of the front and the back necks, cut a facing of 1¼″ width exactly to the shape of the neck.

HOW TO PREPARE THE SKIRT FOR THE LAYOUT OF THE PATTERN PIECES

Cut along the seam at the waist-line and remove the pleats. Open out the side-seam and iron the skirt flat.

HOW TO LAY THE PATTERN PIECES ON THE SKIRT PIECE AND CUT OUT THE PATTERN

Pin the pattern pieces to the fabric as shown in Fig. 6, leaving ½″ of material over the border and cut the different pattern pieces. In the back skirt, cut a slit 2½″ long down the centre of the waist to form the continuation of the opening of the back bodice.

The facing and the band for the back opening are to be cut from the small bits of fabric left over. Canvas or long cloth may be used as interfacing for the belt to keep it stiff.

HOW TO MAKE THE FROCK

Note : ½″ is allowed for ordinary seams and 1/8″ for bands, etc.

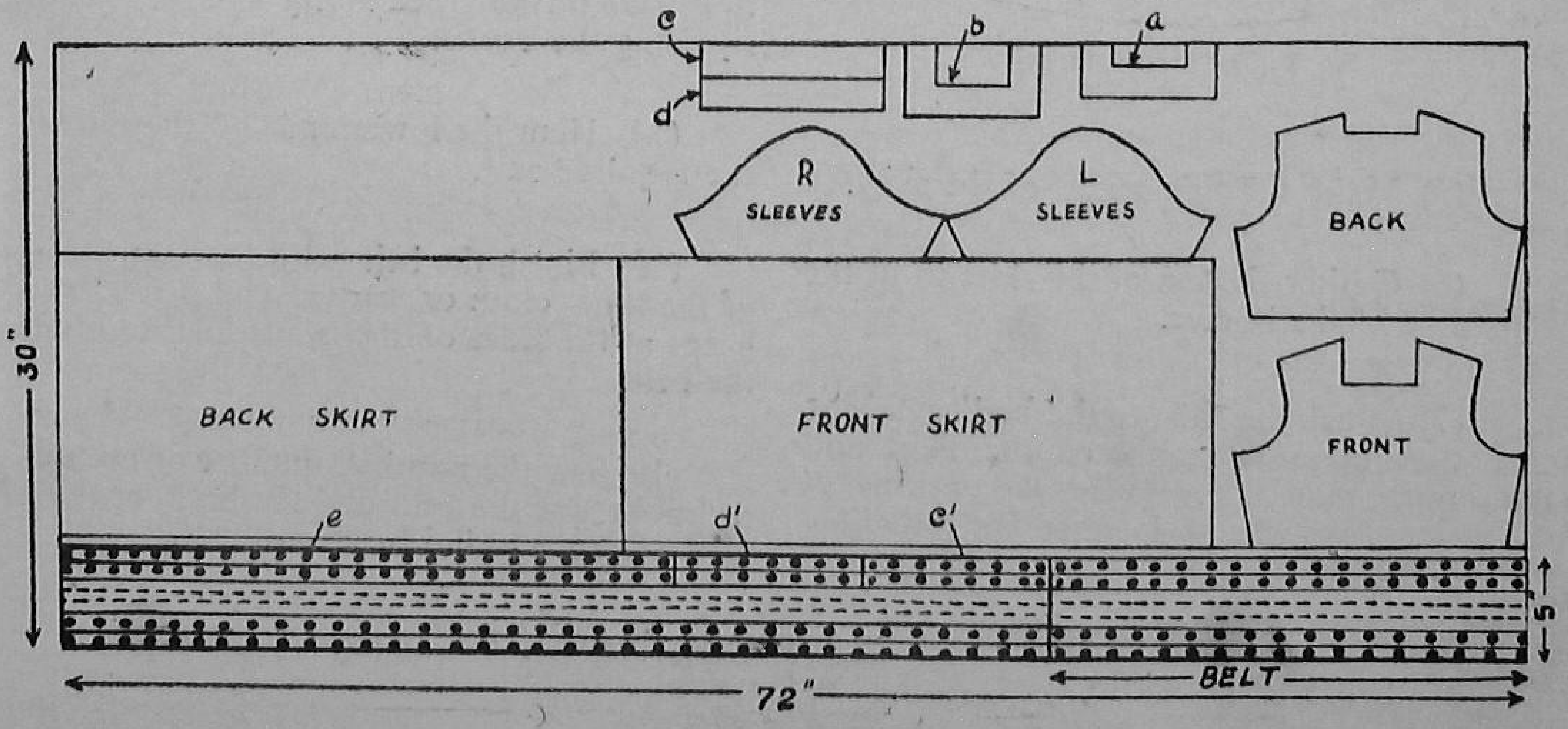
(1) Make the shoulder seams of the bodice.

(2) Join the facings of the front and the back neck and face the neck.

(3) Make the side seams of the bodice.

(4) Make two darts of ½″ width at the the back to shape the waist.

Fig. 6 (layout of the pattern pieces on the skirt piece)



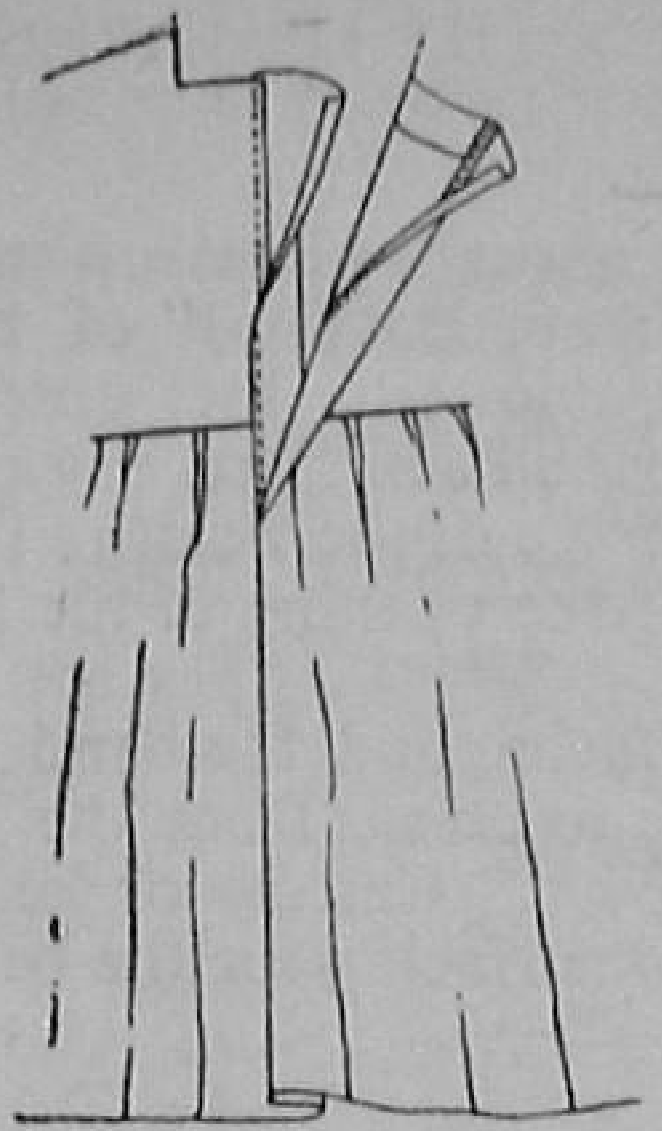


Fig. 7 (The botton band and facing of the opening placed at the back of the frock)

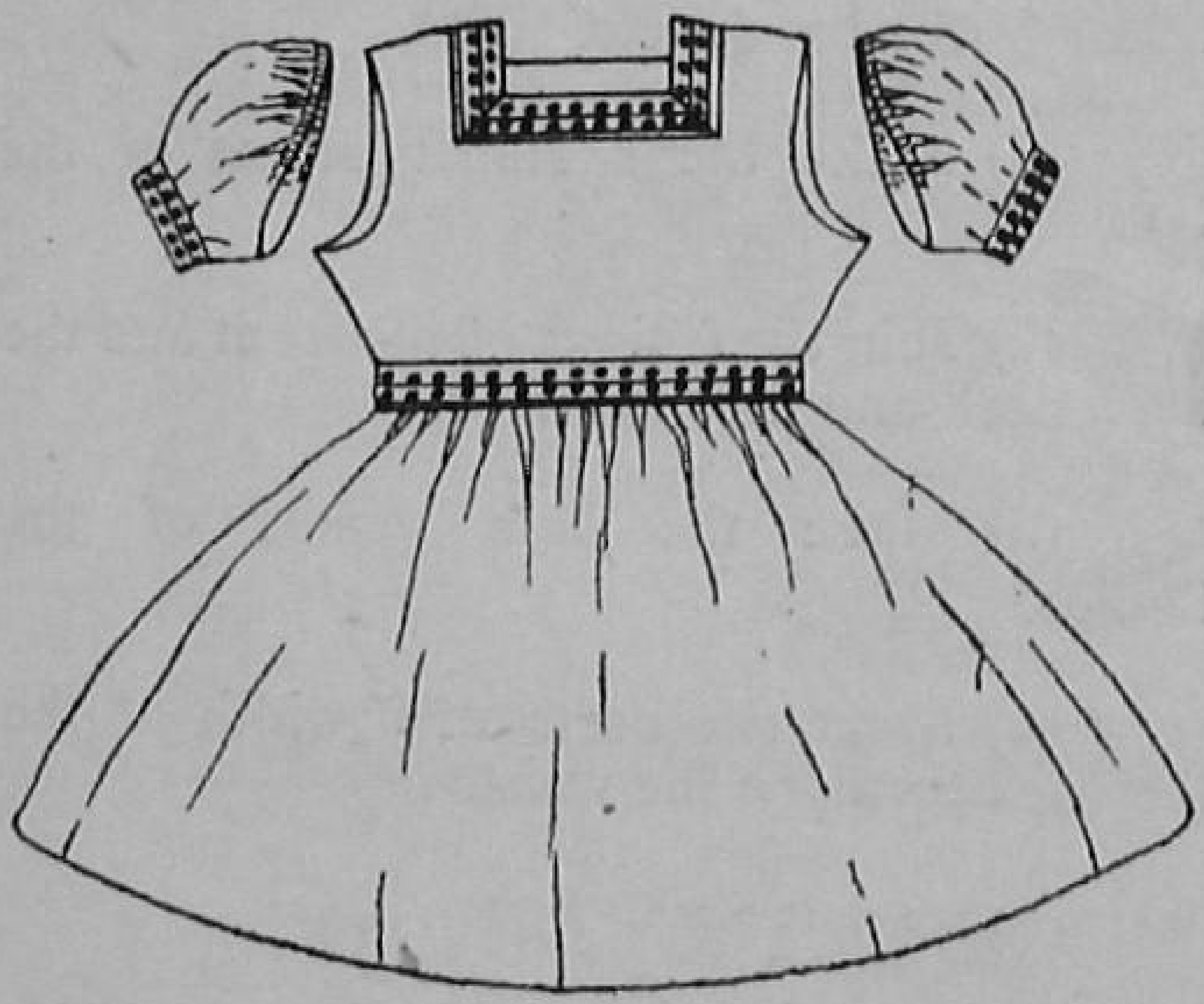


Fig. 8 (The frock pieces)

(5) Make the side seams of the skirt.

(6) Gather the top of the skirt to fit the waist-line of the bodice.

(7) Attach the skirt to the bodice, taking care that the side seams of the skirt and the bodice match. *Note that the opening at the back is from the neck down the end of the slit in back skirt.*

8. (*Follow Fig. 7*) Face the right side of the opening with a strip of cloth 1¼" wide from the neck down the skirt. Make a protruding band, 1" wide after finish at the left side of the opening from the neck down the skirt. Place the facing over the band and see that the waist-line seams of both the sections of the back bodice are in line. Secure the band in position with a few invisible stitches.

(9) Gather the lower edges of the sleeves to the required size.

(10) Make the side seams and attach the sleeve-bands so that the borders form the outer sleeve-bands.

(11) Leaving 2½" free from either end, gather the top of the sleeves to fit the armhole

(12) Attach the sleeves to the bodice of the frock so that the side seams of the bodice and the sleeves match. The portion cut deeper in the sleeve-head should come to the front of the bodice (see Fig. 8). Adjust the gathers of the sleeves-head evenly on both sides of the shoulder line (see Fig. 8)

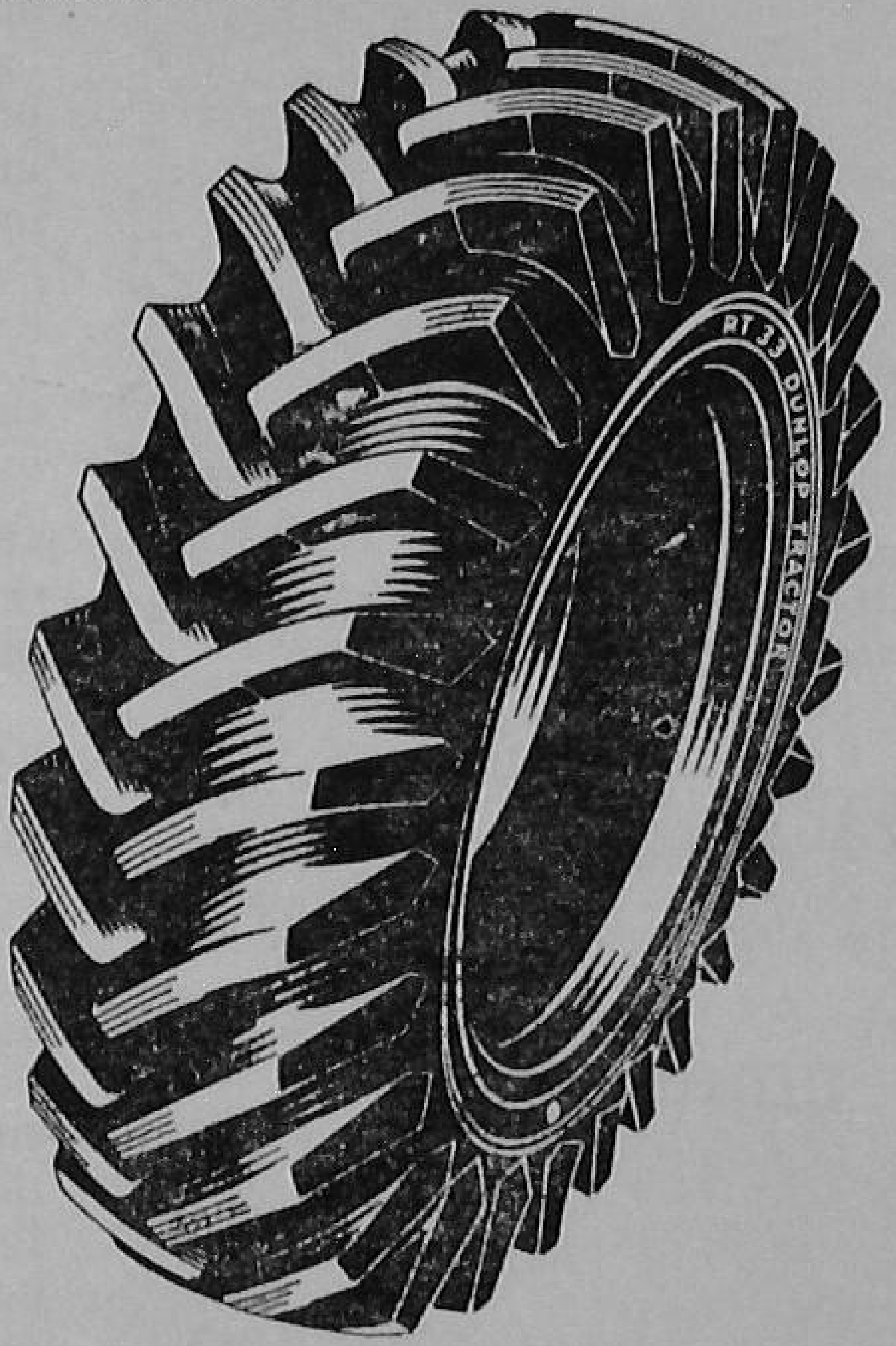
(13) Take a straight piece of border, 1¼" wide and long enough to go round the neck allowing for turnings. Attach this to the right side of the frock along the neck edge, squaring the corners.

(14) Hem the lower end of the skirt to the required size.

(15) Finish the belt with the interfacing of the long cloth or canvas and make two loops at the sides of the waist-line to insert the belt.

(16) Sew the required number of buttons or hooks for the belt and the back opening of the frock and finish the garment.

This tyre lowers your costs



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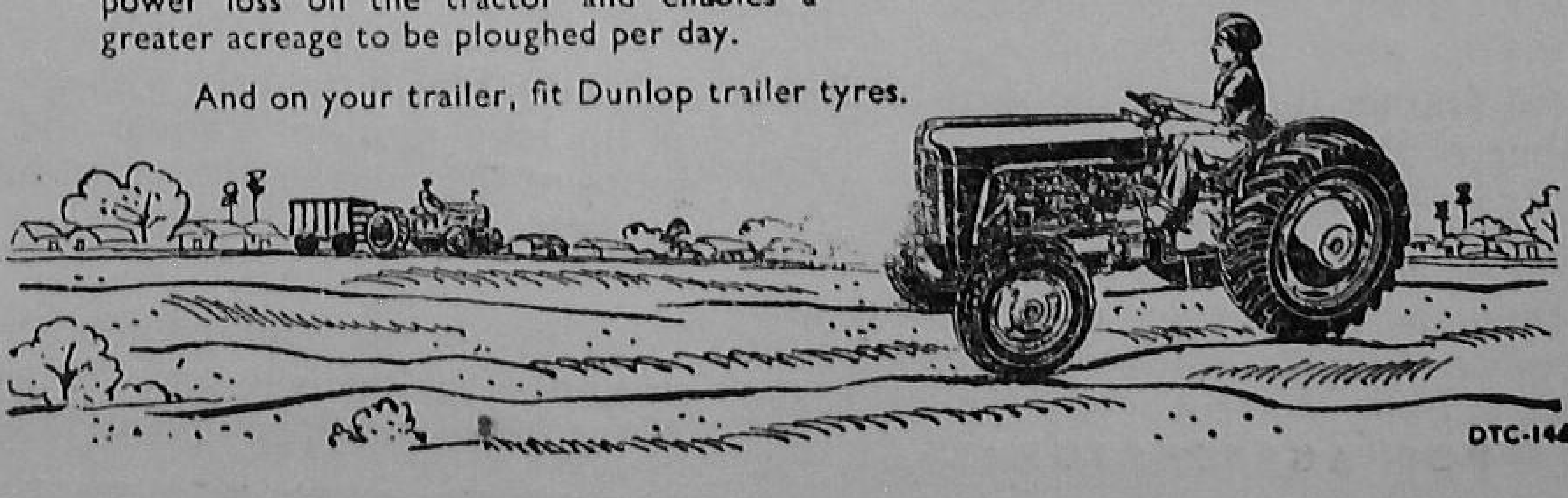

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THE PICTURE ON THE COVER

Tobacco needs clean cultivation to grow well and yield well. That's why this progressive tobacco farmer of the Package Programme District, West Godavari, Andhra Pradesh, sees to it that the crop gets three to four interculturings.

—Photo by R. Paul

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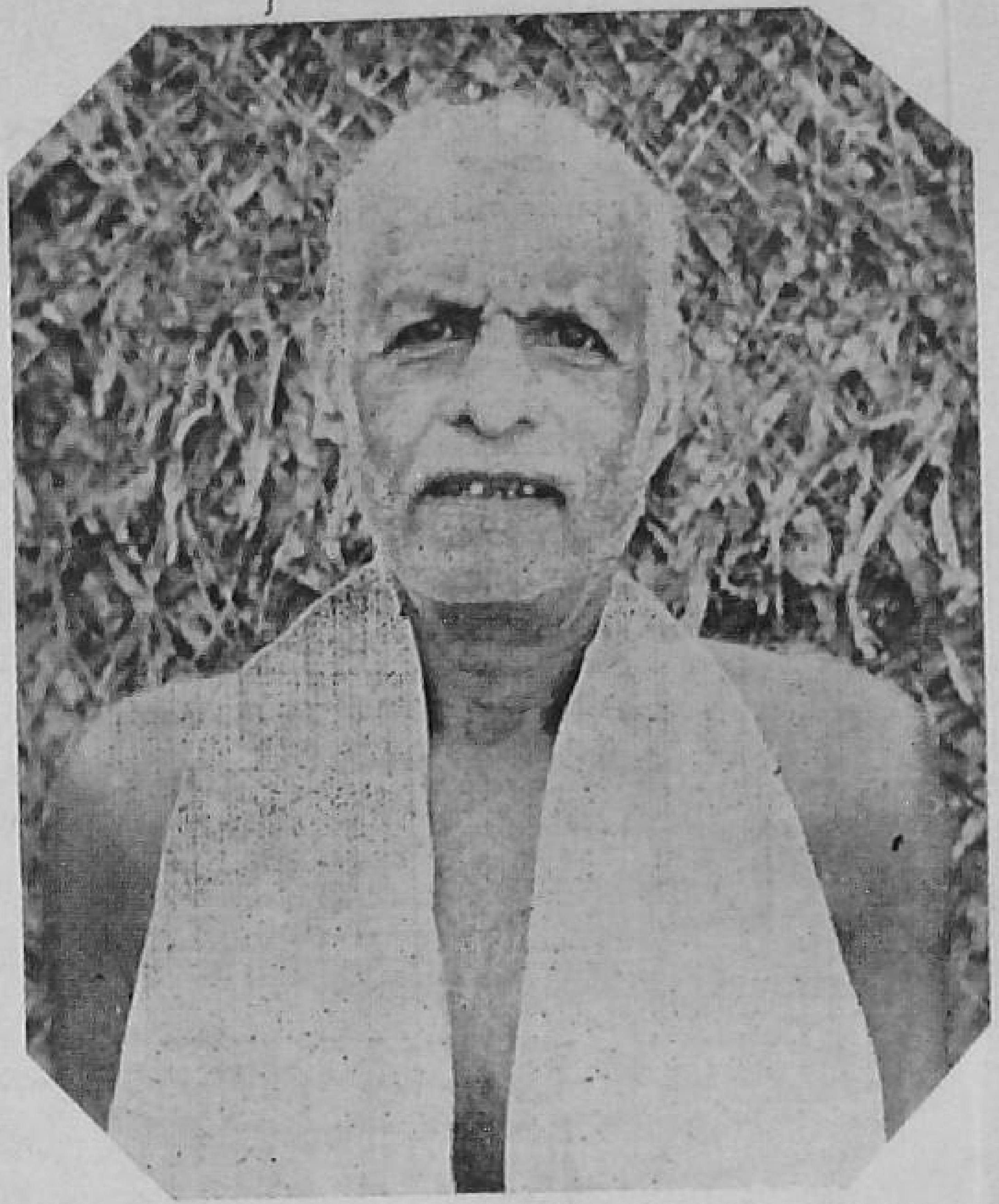

SURE, MIXED FARMING IS A BETTER FARMING

By R. HALI

"CHANGE over to mixed farming pattern, if you want to keep your farming always paying," this is the advice which a 70-year old Kerala farmer wants to give to young farmers. The farmer, Shri Vargheese, bases his advice on his 60 years' experience and association with the soil.

His own farm is an example of the advice he gives. On his three-acre plot, he grows banana, yam, tapioca, elephant yam and pulses, all in the same season. Such a combination fetches a handsome yearly profit.

This is how he practices mixed farming.

* February is a busy time for Shri Vargheese when he plants banana suckers fifteen feet apart. He follows up by sowing elephant yam cuttings in the centre. Yam cuttings are also sown on the same day on the four sides of the elephant yam.
* Just after the first showers in March, two tapioca cuttings are planted on two sides of the elephant yam cuttings. Broadcasting of some pulses in the land, if any left, completes the sowing operations.
* At the time of planting, he gives only a cow-dung—wood-ash mixture as a basal dressing. Banana gets three pounds, while elephant yam, yam and tapioca receive one pound each.
* According to Shri Vargheese, timely top-dressing is a very important operation. Once in thirty days after a light earthing-up, he applies cow-dung,

wood-ash and green manure to every plant. But tapioca gets always F.A.C.T. fertilizer mixture, ¼ pound per tree, once in 30 days as top-dressing.

* Banana and yam are ready for harvest in January but elephant yam is taken from September. Tapioca is collected by December.

This way 380 rupees are almost assured from an acre of the plot. Banana contributes about Rs. 140, and an equal amount comes from elephant yam and yam. A hundred rupees can be considered as a safe sale-proceeds from tapioca.

With this much profit in hand, Shri Vargheese declares "I have found that mixed farming is the best way to get maximum profit from my farm."

This is Shri Varghese's farm which yields Rs. 380 to an acre

A sapota bridge-grafted on *rayon* root-stocks

IF IT IS SAPOTA YOU SHOULD TRY GRAFTING

By I. A. SAYED

YOU should always propagate sapota by grafting, if you want to get healthy, high-yielding trees.

Until about a decade ago, farmers used gooteeing for multiplying sapota. But it is a very slow and uncertain process; gootees take very long to be ready for planting in the main field and then 30 to 40 per cent of them die while they are being removed from the mother plant.

For raising good healthy grafts, it is, however, necessary to have a suitable root-stock. Sapota seedlings make a poor root-stock because of their slow growth, and shallow root system.

Research work carried out during recent years shows that *rayan* (*Manilkhara hexandra*) is the best root-stock for sapota.

Sapotas on *rayan* stocks gave 50 per cent more yield than gootees and double than those raised on sapota stock. Also the trees raised on *rayan* stock are healthy and remain so even after two decades.

Rayan also known as *khirni* or *pala* grows wild in many parts of Gujarat. To raise *rayan* seedlings, soak the seeds in warm water overnight, and sow in well-prepared, raised beds. When the seedlings are six inches high, pot them. You can as well use self-sown seedlings for grafting which can be

Grafted sapotas always yield more

collected from the jungles. To obtain a clean stem for grafting, check the growth of the side shoots that arise on the stem up to about a foot from the ground by pruning regularly.

Even if you have a sapota garden raised from *gootees*, you can provide support to the existing trees with *rayan* seedlings. Plant one *rayan* seedling close to each tree, and when it is fully established, graft it to the tree by the bridge grafting method. Also graft two or three most vigorous shoots arising from the *rayan* seedling to the tree trunk.

By using *rayan* seedlings as support, you will be saving in the cost of irrigation. Usually sapota needs a large amount of water, but as the roots of *rayan* go very deep into the soil, you will have to irrigate less. Also there is no fear of such trees being uprooted due to strong winds as happens when raised on sapota root-stocks or when not supported by *rayan* seedlings.

That is why more and more farmers are giving up the old practice of propagating sapota by *gootee* and are changing over to grafting. You too should take to grafting this time.

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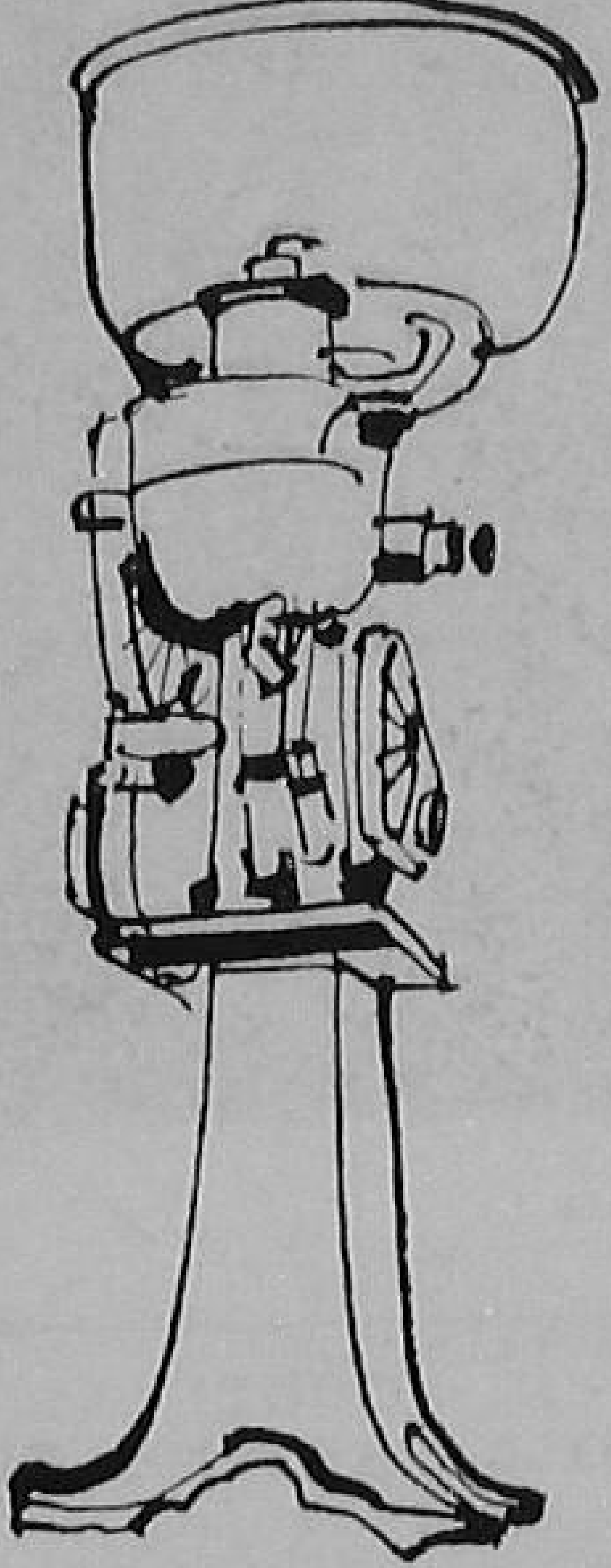


CREAM SEPARATOR

By HARBANS SINGH

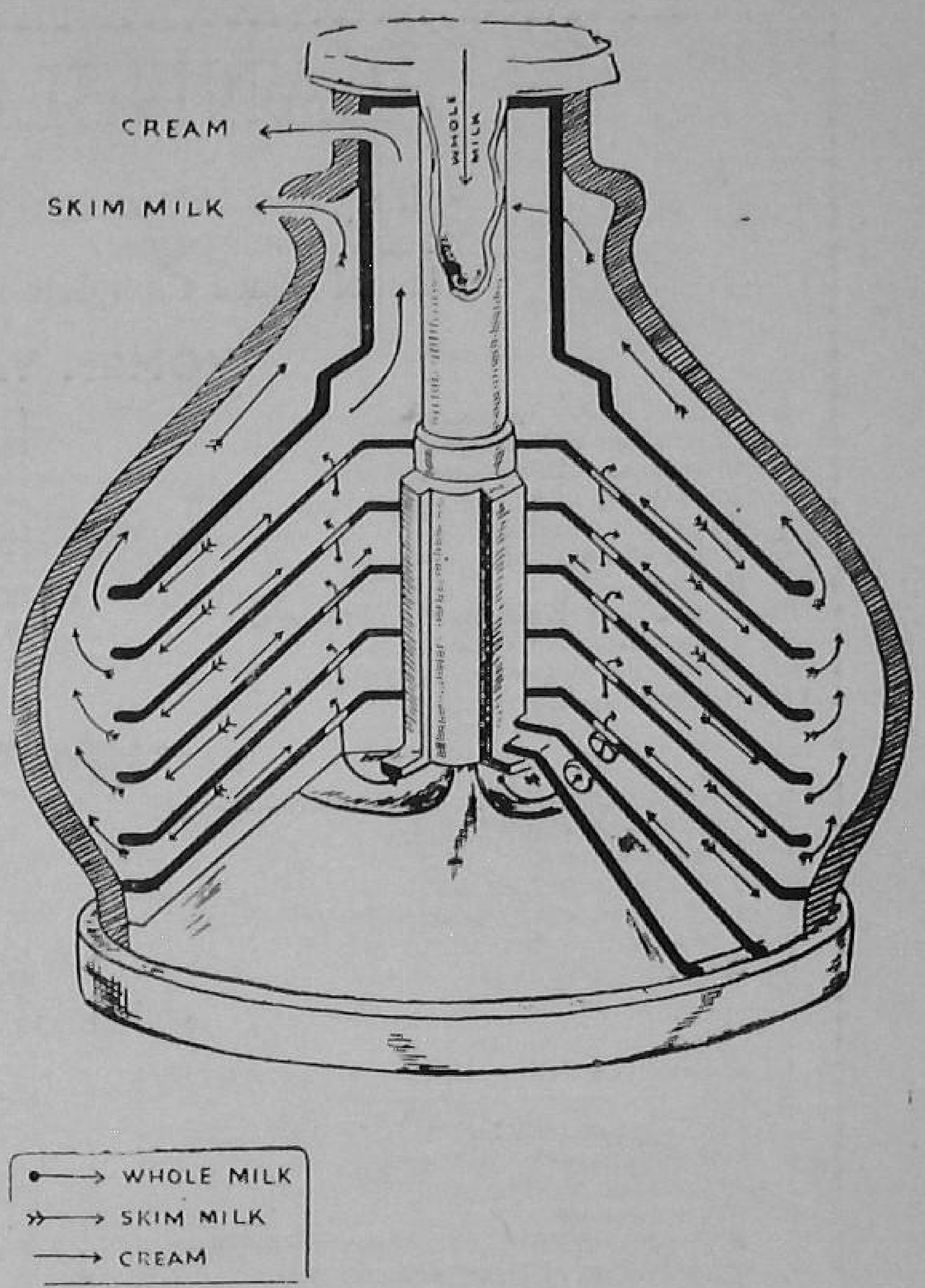
QUITE a few farmers today are using cream separators for obtaining fresh cream. They find the machine very convenient, simple to operate and cheap to maintain. More are going in for separators in areas where milk is available in sufficient and large quantities.

However, to get the best results, it is very necessary that the cream separator is properly looked after.

First, milk (that is to be separated) should be clean. The dirt in the milk collects in the bowl of the separator, and clogs the bowl passage, which results in loss of butter fat. Hence, strain the milk through a double muslin cloth before pouring it in the separator.

Keep the separator extra clean. Soon after use, pass enough clean warm water through the machine. This will wash away all the milk particles sticking to the parts of the separator that have come in contact with the milk, and rinse them with cold or lukewarm water. Then wash them thoroughly with warm water and soda. Do not use soap. Finally, rinse all the parts with plenty of boiling water. Allow the parts to dry and store them in a clean place, free from dust and insects. Keep the separator bowl dis-

mantled except while in use. If the separator is left unwashed for a number of hours, bacteria and moulds grow in the milk left in the bowl. The cream during the following separation gets highly contaminated with those micro-organisms.



The figure shows the passage of milk in a separator bowl

You need to take special care in washing the bowl discs and the rubber ring. Wash the discs by placing them in a pail and moving them up and down rapidly with about one inch stroke, first in cold, then in hot water containing soda. Next, rinse up in clean scalding water and dry. You should rinse the rubber ring in warm water, taking care not to stretch it. Do not hang the rubber ring on a nail or peg. Lay it flat. Keep oil or butter fat away from the ring, as this is harmful for rubber.

The cream separator should be kept well-balanced on a solid and level foundation. The best type of foundation is the one made of concrete. It should be set firm and remain so while in use. The machine should always be kept well-lubricated.

Always run the machine steadily and smoothly. Of course, there will be slight vibrations of the bowl when you start or stop the machine. Never attempt to remove the milk or cream spout while the bowl is running. Always allow the bowl to stop on its own accord. Maintain a constant bowl-speed throughout the entire run. If you slacken the speed of the bowl, butter fat will be lost.

The separator must be started slowly and the speed increased gradually. As soon as the correct speed has been obtained, the turning of the crank handle should be maintained at an even speed. Do not revolve the handle with jerks. Avoid skimming at more than the rated capacity of the machine. Attain the maximum speed, before the milk is allowed to enter the machine. Pass a little warm water through the machine before the milk is allowed to enter it. This will warm up the metal to the temperature of the milk. Also feed the separator evenly.

With this much care, your cream separator will give you good service.

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Tobacco fields are pot-irrigated once or twice a day

THE SOIL IS ALMOST SAND

but the TOBACCO is good

ON the sea-shore of northern Kerala, the 2,000 acres on which chewing tobacco is grown are almost pure sand. But that does not prevent local farmers from getting as much as 2,000 pounds of leaves from an acre. How such a good yield of tobacco can be obtained makes a very interesting story of what intensive cultivation can do even where the conditions are not so favourable. And this is not all. The paddy crop which follows tobacco, yields 4,000 to 5,000 pounds an acre.

The farmers sow the seed of local chewing varieties in raised nursery beds during August. Just one ounce of seed sown suffices for transplanting an acre of land. The beds are 12 feet long and 4 feet wide.

A good tobacco crop—result of intensive cultivation

Beds are manured with small doses of cattle manure and fish manure. Seedlings are transplanted in the field during October and November. The field is ploughed well and furrowed nine inches deep and at a four feet distance.

Compost manure, at ten cartloads to an acre, is put in the furrows to a height of six inches and is later covered up with an inch of soil. Seedlings are transplanted during October-November 1½ to 2 feet apart in these furrows. Weeding is done five to six times.

The land is irrigated very frequently. Pot-watering is done once or twice a day. For this purpose, small ponds are dug up well in advance in the field itself.

When a plant has put forth 16 leaves, the terminal bud is nipped off. No auxillary bud is allowed to grow since it affects the quality of leaves.

In addition to compost, nearly 8,000 pounds of fish manure, very cheap in these parts, is given in three doses ; the first one 20 days after planting, the second 25 days later and the third one 15 days after the second one.

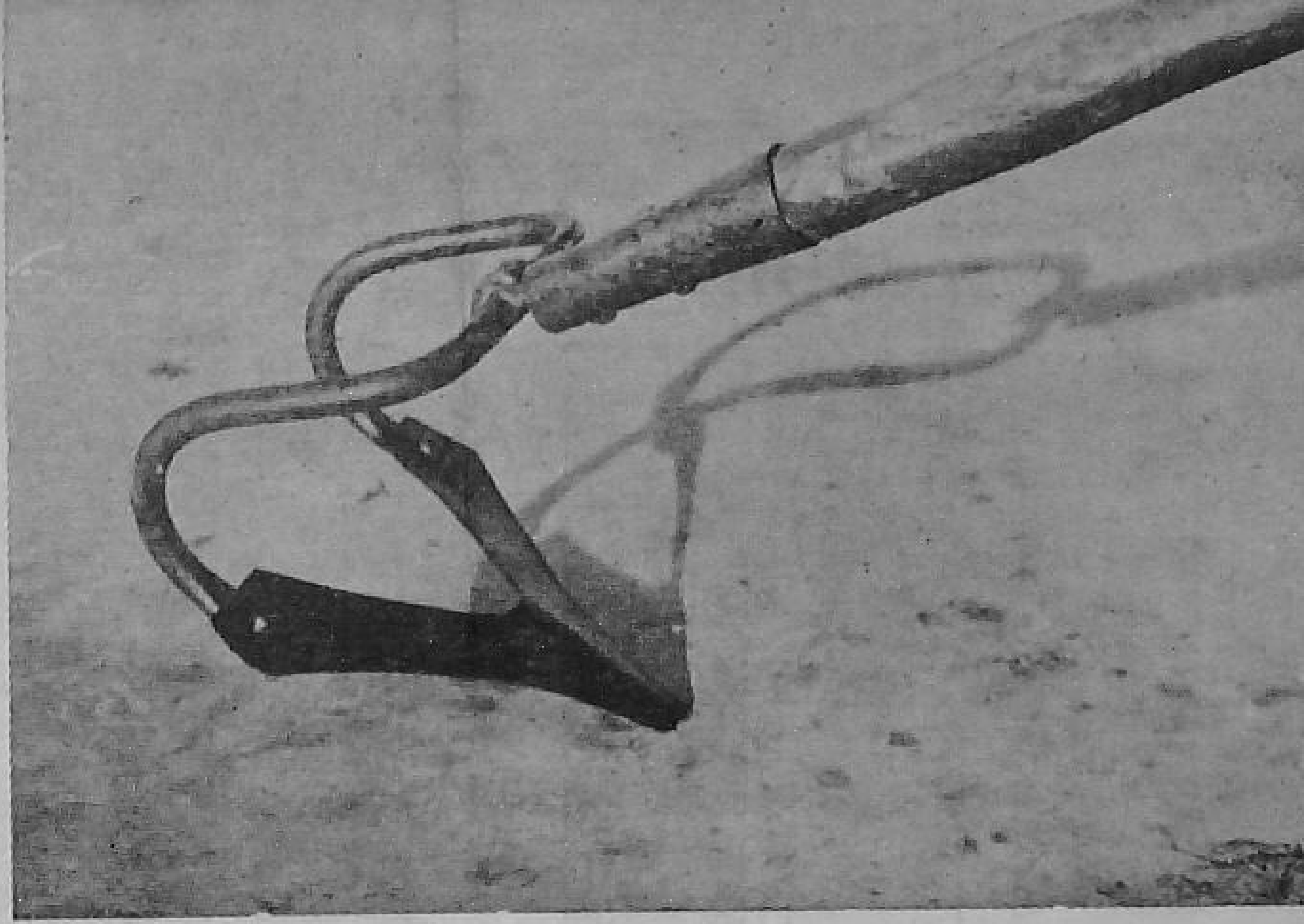
The farmers, not satisfied with just these manures alone, also give 400 pounds of ammonium sulphate or some other nitrogenous fertilizer to an acre.

The crop is harvested after 100 days of planting. The plants are cut and left in the field for about a day. They are then collected, tied and stored in *pandals* for 18 days. Three to four leaves from the bottom are removed and are graded as second grade tobacco.

The plants are then removed from the *pandals* and kept for about five days. Next, they are rearranged and again kept for five more days. They are then tied into small bundles and sent to the market.

Paddy, grown after tobacco, also gets the benefit of the heavy manuring given to the tobacco crop. That is the main reason why rich paddy crops are not uncommon here.

—M.C.N.



SHARMA HOE

FOR A FASTER JOB

By D. N. KHERDEKAR

WHETHER for field crops or garden crops, you can safely replace *khurpi* with Sharma Hoe for the weeding operation.

Farmers in the Delhi area and elsewhere can tell you how good this weeding Hoe is.

Costing only three rupees, you can work four to five times faster than what you can with the traditional *khurpi* !

The Hoe has a V-shaped sharp blade and a five feet long bamboo handle. So you can operate it even while standing. The sharp blade cuts the grass and the soil very easily. It is so convenient to handle that even a boy can use it with ease.

However, remember to sharpen the blade each time before use, if you want to get a good job out of it.

Weeding is perhaps the best way to increase yield without much investment, and Sharma Hoe is the best implement for doing it.

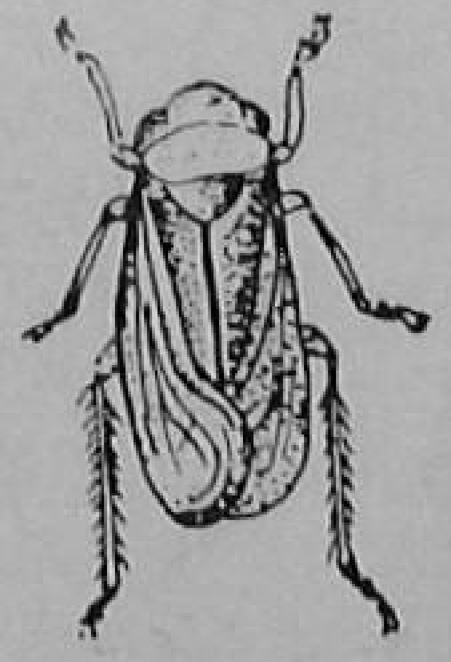
Keeping RICE pest free

By D. B. REDDY

FROM the time you sow rice, you have to protect it against the attack by the many insects and diseases. You must have already treated your paddy seed with an organo-mercurial compound to control the diseases which are carried with the seed. In the nursery stage, you must also have sprayed the seedlings to control the stem borer, and blast and helminthosporium diseases.

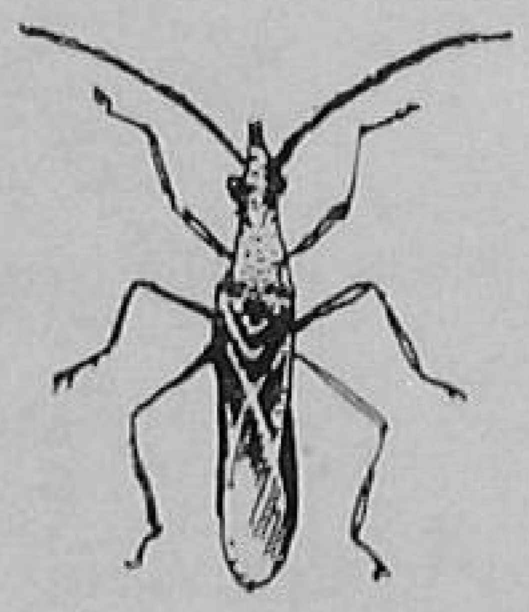
Many more insects may yet attack your standing rice crop. The rice hispa is one of those that may cause trouble. This is a small bluish black beetle with many short spines on its body. It scrapes the green matter from the leaves and the attacked leaves dry up and appear brownish yellow. The larva of the hispa also feeds on the green matter within the leaf tissue. Actually, the larva and the pupa live within the leaf tissue, and it is only the adult which comes out. The damage caused by the rice hispa is often serious.

But it is easy to control this insect. Before transplanting, clip off the tips of the seedlings and burn them to kill eggs and larva of the hispa which might be inside the leaf tissue. If the insect attacks the crop, dust 5 per cent BHC at 15 to 20 pounds per acre.



Leaf hopper

The other insect which can cause trouble is the swarming caterpillar. As the name indicates, the caterpillars move in swarms like an army from one field to another destroying them as they move on. The caterpillars are smooth, cylindrical and dark to pale green in colour with dull stripes on the back and on the sides. These are the caterpillars of a stout dark brown moth which does not feed on rice and may not easily be seen in the fields. The swarming caterpillars eat away the green portions of the rice plants.



Gundhi bug

You can easily control them by dusting with 10 per cent BHC, or spraying with 'Endrin' 0.03 per cent or DDT 0.25 per cent. But spraying or dusting only your own fields will not be of much help. Your neighbours also should take up the control measures. For this, you should pool all the dusters and sprayers in the village and see that the entire village or even all the villages in your Block take up the dusting or spraying. Community action is of great importance in fighting the swarming caterpillar.

You may find your rice crop also attacked by the caseworm and the jassids. The caseworm causes heavy damage where rice is grown in swampy areas. The caterpillars are greenish in colour. They cut the paddy blades into short pieces and build tube-like cases in which they remain and feed on the leaves.

The jassids are small insects which hop about and swarm in large numbers. These suck the sap from the plant and almost drain it to the point of drying.

The caseworm can be controlled by dusting 5 per cent BHC or by spraying 0.25 per cent BHC. It is better that you drain the fields if the attack is severe. You can control the jassids by dusting the crop with 5 per cent DDT or 10 per cent BHC at 15 to 20 pounds per acre or 0.15 per cent DDT spray at 30 to 40 gallons per acre.

Paddy grasshopper

You may find helminthosporium and blast diseases attacking the rice crop. Spray 5:5:50 Bordeaux mixture or a copper fungicide (containing 50 per cent metallic copper) one pound in 30 gallons of water at 40 to 50 gallons per acre.

Paddy needs w

water, but how much?

By H. C. NANJIAH

No DOUBT paddy needs plenty of water throughout its life time, but this varies with the different stages of its growth.

If you supply the correct amount of water during these stages, you will get better paddy yields. Of course, this would mean controlling the field water as and when necessary.

NURSERY STAGE

Rice plants do not need standing water in the nursery stage. If you keep the nursery plot always flooded, the growth of the plants will be badly affected and they will tiller poorly. Better irrigate at regular intervals to keep the bed moist. This will lead to better root development and tillering.

But do flood the plot once, one or two days before you pull out the plants for transplanting to avoid injury to the roots.

VEGETATIVE GROWTH STAGE

After transplanting, have three to four inches of standing water in the field for seven to ten days. This will help the seedlings in developing their roots further. Gradually reduce this level of water to 1½ to 2 inches, and maintain it for 30 to 40 days. This is when the tillers will bear the panicles. Overirrigation at this time will only encourage the formation of large numbers of tillers which will not bear any grain. After this, about 37 days before grain formation, drain out the water from the field completely and leave it that way for five to seven days.

GRAIN FORMATION STAGE

See that the plants do not suffer from want of water at this stage. Otherwise it will result in poor grain formation and thus the yield will go down. Hence, let in water again to a level of three to four inches at this stage.

RIPENING STAGE

When the ripening stage comes, which lasts for about 25 to 30 days after flowering, reduce the water level to 1½ to 2 inches. Stop irrigating 7 to 10 days before harvesting.

Irrigate your paddy at the proper time and give water in the right quantities—this will result in high yields.

Deep litter

THE BETTER PROFIT METHOD

By S. G. IYER

MANY poultry keepers who raise the birds confined in houses all the year round are now providing a layer of deep litter on the floors of such houses. This is a good practice.

A six-inch deep layer of litter on the floor keeps the birds healthy, and also adds to their comfort. Birds raised in such houses are found to lay 10 per cent more eggs, and the eggs obtained are clean. The birds also have little trouble from worms and coccidiosis and they do not develop bad vices like feather picking or egg eating, when raised on deep litter. Besides all these, you will find the litter a valuable manure after a year.

There are various cheap and locally available materials which you can use as litter, like wheat straw, paddy straw, dry hay and dry leaves cut into pieces, or paddy husk, or groundnut shells and dry cow-dung or saw-dust. Do not use sand as litter. Spread the litter six inches deep on the floor before you bring in the birds. Better start the litter house one or two months prior to monsoon.

The litter material and the droppings

that fall on it together produce heat which kills many disease-germs in the litter layer. And the birds have less trouble from worms and coccidiosis.

Take care that the roof of the poultry house does not leak as otherwise the litter will get wet and there will be wet patches on the floor. In case the litter gets wet, add hydrated lime at one pound for every eight square feet of the floor area. The floor of the house should be made of cement concrete or earth.

Stir the litter from time to time to mix the droppings with it. Add fresh litter now and then to maintain the original level of the litter layer. See that the house is well ventilated, and the litter is always dry.

Essential vitamins such as B12 and riboflavin are built up in the litter. Birds take these and add up to their daily diet.

Avoid overcrowing birds in deep litter houses by providing each bird with four square feet of floor space. Birds in litter houses feel happy and produce the maximum number of eggs.

Provide a mash hopper in the house which can hold a week's supply of food. Also provide nest boxes (community type). Use shallow vessels for watering the birds to prevent the litter from getting wet.

Chicks grow better on deep litter. In a 10 feet by 10 feet room you can keep 100 chicks till they are 8 to 10 weeks old. After this, thin them out. This practice is good where you raise poultry for meat and market the birds at early ages.

When the litter layer is a year old, remove and use it as manure. It contains two per cent nitrogen, three to four times more than what compost or farmyard manure contains.

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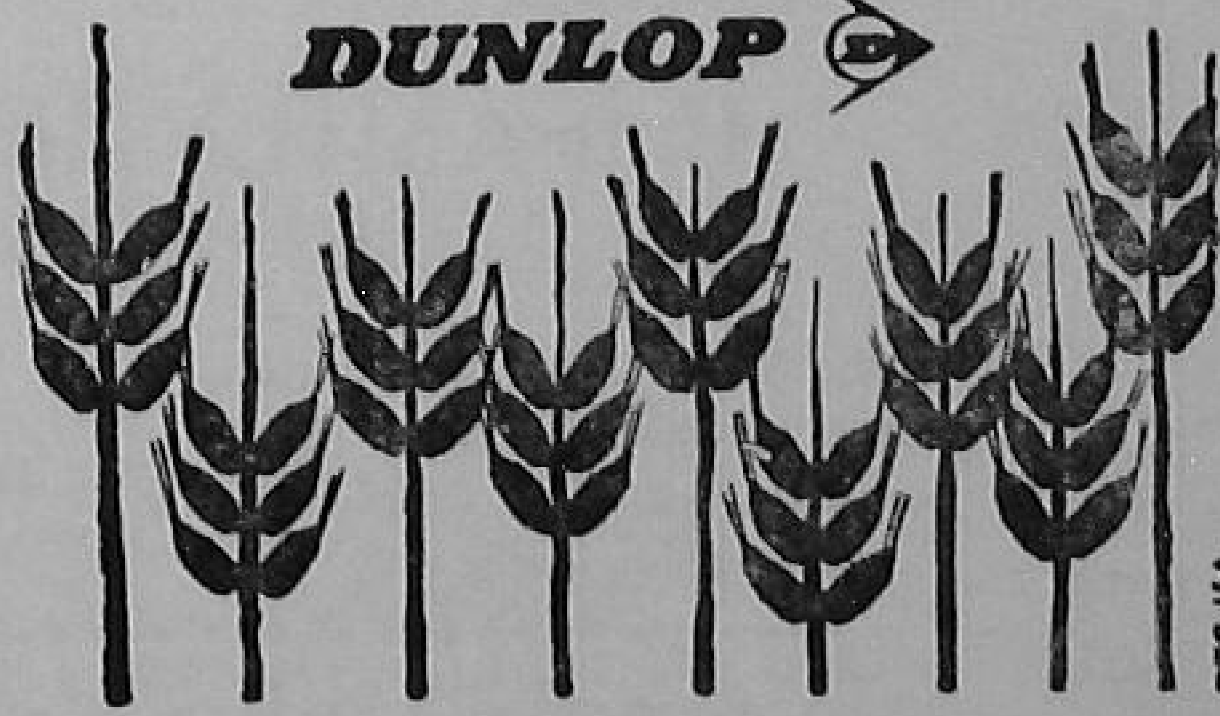

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14. Jowar Stem-borer
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If you like BREADFRUIT, grow it

By M. C. NAYAR

IF YOU like breadfruit, then why not have the breadfruit tree right in your own garden? A few breadfruit trees will give you enough fruits; when you get more than what you want you can sell and make some money too.

The fruits are delicious and nutritious. They can be used as vegetables as well. Many housewives prepare a number of tasty dishes from the fruit.

Breadfruit is a tropical tree. You can grow it in areas which enjoy a warm and humid climate and receive 80 to 100 inches of rainfall in a year.

Breadfruit grows well on a laterite red loam soil with a high amount of organic matter in it. Also see that the soil is at least five to six feet deep and is fairly well-drained.

There are two varieties of breadfruit—one, the seeded, and the other seedless one. The first one you can raise by sowing the seed. This variety is not so commonly grown. The other, which is popular, is raised from root suckers or root cuttings.

To obtain root suckers dig out the soil from a small area near the base of the tree. Next, make a wound in the root. The root suckers will grow from here. Another method is to collect roots 1½ inches in diameter and 1½ to 2 feet long and plant in horizontally dug shallow pits. Cover the roots leaving two or three inches of the thick portion above-ground. Root suckers will emerge from here.

PLANTING

Dig out three feet square pits ahead of the time of planting and fill them with a mixture of river sand, top soil and decomposed cattle manure or compost. During

You can prepare a number of tasty dishes from breadfruit

the monsoon season, select healthy suckers and plant in these pits adopting a spacing of 35 to 40 feet between two plants.

The plant grows well under shady conditions also. You can, therefore, plant it under big trees. This will also help prevent sun-burn.

AFTER-CARE

Allow no weeds to come up. If there is no rain, water them regularly till they establish.

If you want more and better fruits, you must manure the plants well. Dig a shallow basin around the tree and apply about 50 to 100 pounds of cattle manure and two pounds of superphosphate in the monsoon season.

In addition to this, apply three to four pounds of superphosphate or bone-meal every year for four continuous years after planting the suckers.

There is one way of increasing the size and number of the fruits set—this is done by artificial pollination. Collect all the male flowers 10 days after they emerge and dust the pollen from these on the female flowers which are not less than three days old. You should do this in the morning hours.

Breadfruit is not bothered by any serious pest or disease. The only known trouble is a disease caused by a fungus. As a result of this fungus attack, immature fruits shed. If you examine such fruits you will find a whitish growth on them. You can easily control the disease by spraying Bordeaux mixture. Spray the mixture about three to four times after the fruit-set at an interval of two weeks.

The breadfruit tree will start bearing from the fifth or sixth year onwards. You can obtain about 125 pounds of fruit from a tree per year, on an average.

Hence, a few breadfruits grown in home garden will not only give you the fruits you like but also will bring in a little money, if you care to sell the surplus fruits.

Raise Your Own Green Manure Seed

MANY of our farmers know that agriculture can never pay on a poor soil. That is why they are anxious to improve the soil fertility. But a want of timely supply of green fertilizers and their scarcity often make them feel helpless.

Farmers need not worry for this, as green manuring offers them an easy and cheap solution.

As a matter of fact a number of farmers in Kerala, Madras, Orissa and Uttar Pradesh are putting green manure to an extensive use in their lands and are getting bumper harvests.

GROW IT ANYWHERE

Once they raise the green manure crop on field borders or at odd corners in their farms, they get enough seed not only to sow and manure their fields but also some spare to sell and distribute to their neighbours. They are thus saved of the botheration of getting their fertilizer supply in time.

GROW IT WITHOUT LOSING A CROP

Farmers in these areas have also developed some effective ways of green manuring their fields without losing a season or a crop. For example, farmers in Orissa broadcast paddy seed mixed with *dhaincha* in the field.

A month after sowing, the *dhaincha* plants are uprooted during interculture and trampled in the soil. As a result, their paddy yields increase by at least 162 to 240 pounds to an acre.

CHOOSE ANY ONE OF THESE

It is not necessary for you to stick to *dhaincha* alone for green manuring. Depending on the type of your soil, climate and crops, you can choose your green manure from any one of the following :

Sannhemp, Indigo, Cowpea, Lobia, *Mung, Guar, Ipomea, Sesbenia, Glyricidia, Giant Hemp.*

Whatever may be the green manure you select, your soil is sure to benefit from it and you are bound to get a good crop.

For its many-sided benefit to soils and crops, green manure seed is being widely distributed to the farmers in almost all the states either free of cost or at a nominal price.

Your nearest Agricultural Officer will give you the right type of green manure seed you need for your area and will tell you how to raise it if you do not know it already.

Wherever you happen to farm, do not forget to ask for the supply of your green manure seed from your Gram Sevak or the nearest Agricultural Officer.

Once you grow it, you will know its advantages and would like to grow it regularly for all your crops.

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Why You Should Think of Proper Drainage

By D. S. DHESI

In areas where irrigation projects have been set up, farmers often use too much of water for irrigating their crop. This may be because they get water at cheap rates or because they are not quite sure about when their turn will come next. It is quite possible also that canal may get closed due to one reason or the other. At times, problem of surplus water in the field is caused by heavy rains. This problem becomes very serious in the irrigated areas where the fields are prepared with bunds all around. The water finding no outlet stands and stagnates in the field.

If this water is not drained out, the growth of the crop is stunted and the leaves turn yellow. If this excess of water continues to remain in the field for some time, the plants may even die off. Under such conditions there is no proper aeration of soil.

Lack of air together with high amount of moisture, damages the roots of the plants and also gives rise to many plant diseases. Too much of moisture also reduces the uptake of nutrients by the plants as the bacteria in the soil, which makes the manures and fertilizers easily available to the plants, needs both warmth and air to work.

Also, the seed for germination and the plant for its growth need warmth and air in the root zone. Wet soils are cold soils and take time to warm up. This checks the root growth and further limits the area from which the plants may draw their food.

Apart from all these, wet soil interferes with tillage and other cultural operations.

Water beyond field capacity is no doubt removed by surface run-off, seepage, percolation and transpiration. But these processes are often slow and cannot stop damage to crops.

This makes it necessary to resort to artificial drainage to remove surplus water from the soil surface faster.

In sandy soils the water percolates deep into the soil but creates many other problems. Drainage problem is greater in clay soils.

Excess water from the surface due to rain or too much of irrigation can be removed by surface drainage while to remove excess water from the soil profile and prevent it from percolating deep, sub-surface drainage is necessary.

At present what many farmers do is to transfer their own trouble to their neighbours' fields. This is no solution.

Efforts are now being made under the different projects launched in the country to construct field channels for proper drainage. For proper working of these channels, however, steps should be first taken to dispose of the surplus water from the farms.

By KANTHIMATHI KUMAR

FOR HOME-MAKERS

A SKIRT AND A JUMPER TO MATCH

WITH a little imagination, an old skirt can be changed into an attractive skirt and jumper for a girl.

Measurements:—For a girl whose chest measures 22 inches.

Fig. 1 (Skirt and Jumper—the new garment)

Fig. 2 (Indian Skirt—the old garment)

Jumper : Length 12″, Chest 22″, Shoulder width 9″, Sleeve length 5½″, Sleeve band 8″, Neck 10½″.

Skirt : Length 12″, Waist 21″.

I. HOW TO MAKE THE PATTERN-PIECES OF THE SKIRT AND THE JUMPER

- *General instructions for following the diagrams.*

(a) In the diagrams, the different measurements are given within arrows—the arrowheads showing the exact limits of the measurements. Wherever space does not permit, the measurements are given without the arrows or with the arrows pointing to the measured length. A few measurements are explained with reference to the alphabets in the diagrams and are given below the diagrams.

(b) In the diagrams, the thick lines (——) denote the lines along which the pattern is cut. The dotted lines (......) denote the lines along which the pattern is cut after the first cutting along the thick lines is done. The dash dot lines (—.—.—.) denote the lines used as a guide to draw the curves, etc.

(c) In the diagrams containing the word 'fold', the rectangle consisting of the pattern represents the folded paper taken for pattern-making. Therefore, while taking the paper for drafting the pattern, take double the width shown in the diagram in order to allow for the fold.

(d) Mark the different points, showing the limits of the measurements on the paper taken for pattern-making and draft the pattern as you proceed from point to point.

- *Particular instructions for making the pattern-pieces of the skirt and the jumper.*

(*i*) **The back and the the front of the bodice of the jumper** (*Fig. 3 and Fig. 4*). Draft the patterns of the back and the front of the bodice and cut along the thick lines. Along the central fold of the front, cut a slit 3″ down the centre of the neck.

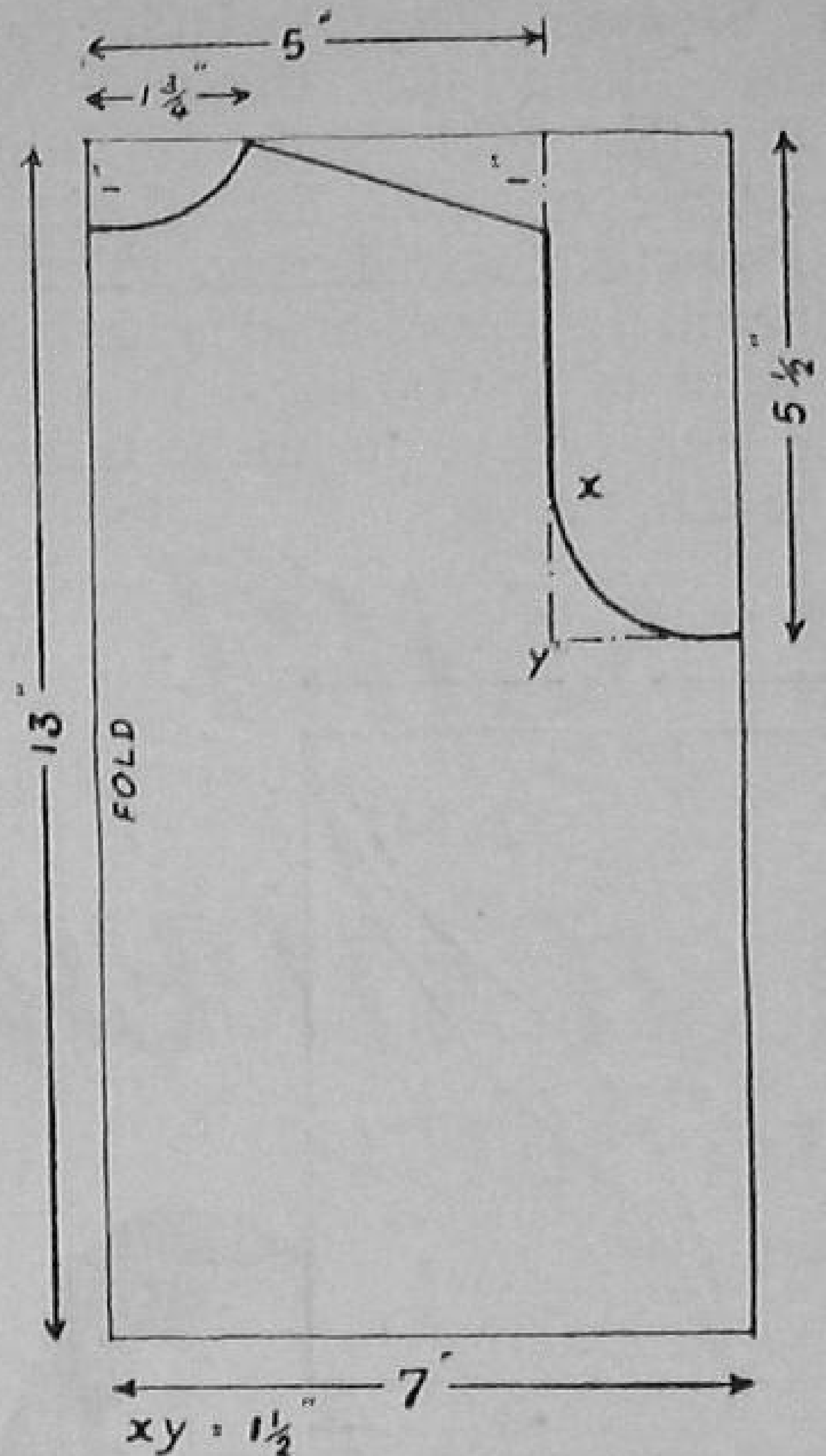


Fig. 3 (Back of jumper)

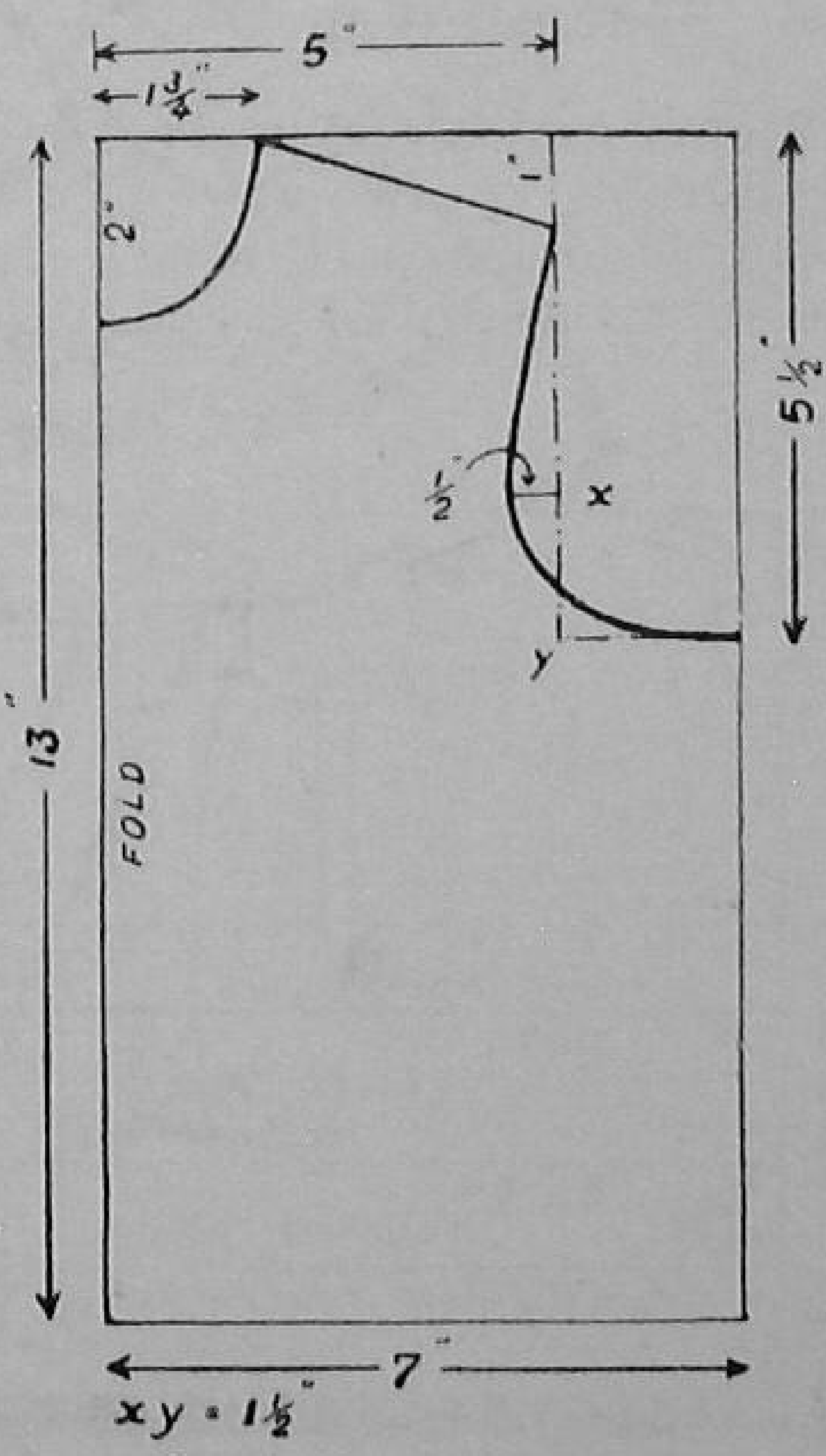


Fig. 4 (Front of jumper)

(*ii*) **Sleeves.** (*Fig. 5*) Draft the sleeves and cut along the thick lines first. Open out the fold and cut along the dotted curve on one half of the sleeves only. Prepare two sleeves. The portion cut deeper in the sleeve-head is to be attached to the front of the bodice. Therefore, note that the right sleeve is to be differentiated from the left sleeve.

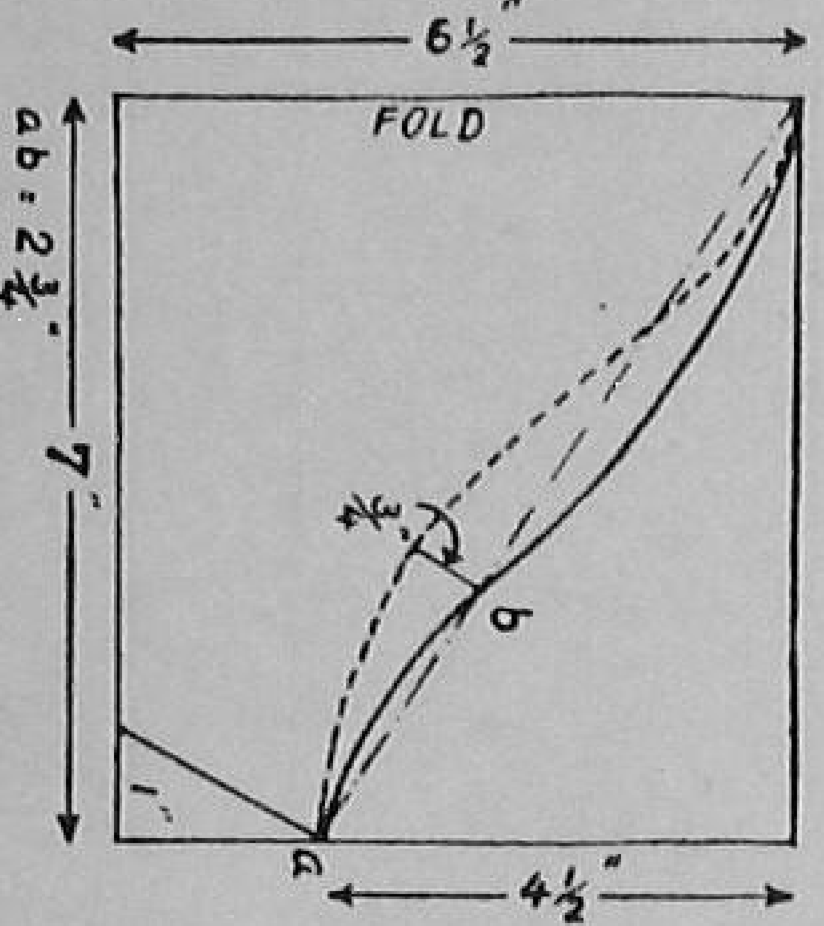


Fig. 5 (Sleeves : ¼ scale)

(*iii*) **Skirt** For the skirt, make two pattern pieces,—one 8½" wide and 56" long and the other 5" wide and 56" long, and mark them 'A' and 'B' respectively.

(*iv*) **Sleeve-bands and waist-bands.** For the sleeve-bands, cut two strips of paper each of which is 9" long and 1½" wide. For the waist-band, cut a strip 24" long and 2" wide.

(*v*) **Collar** (*Fig. 6*). Draft the pattern of the collar and cut along the thick lines. Prepare two collars.

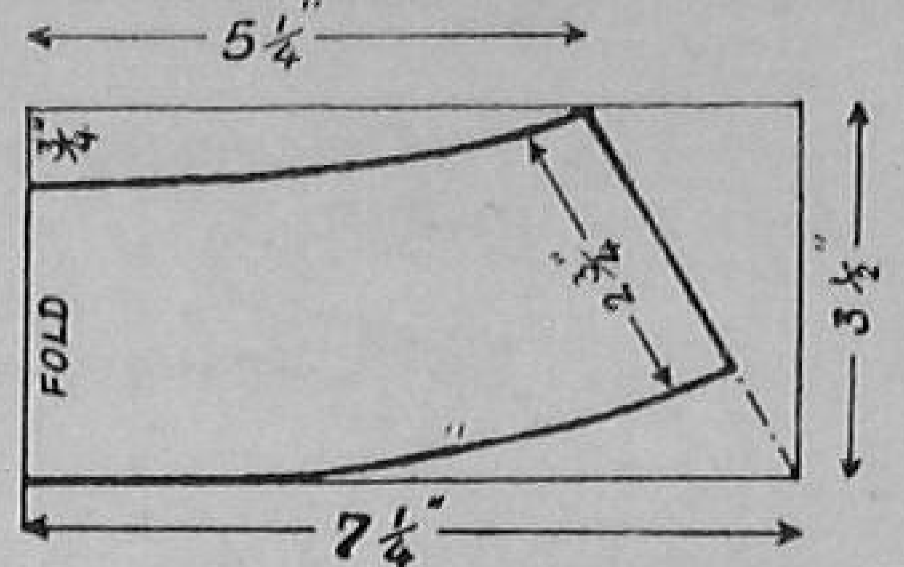


Fig. 6 (Collar: ¼ scale)

II. PREPARING THE OLD GARMENT FOR THE LAYOUT OF THE PATTERN-PIECES

Cut along the seam at the waist-line and remove the pleats. Open out the side-seam and iron the fabric flat. This particular Indian skirt when ironed flat is 72" long and 30" wide.

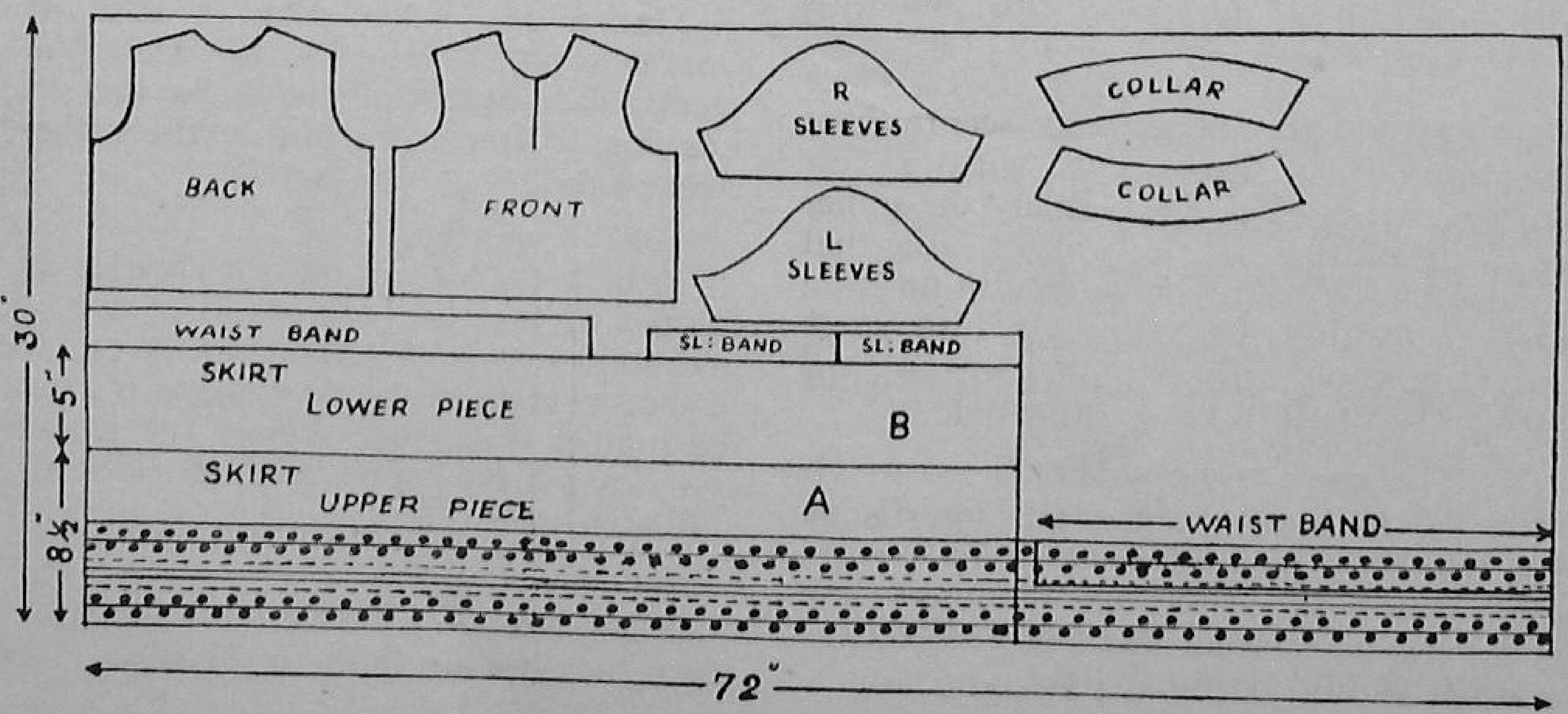
III. HOW TO LAY THE PATTERN-PIECES ON THE FABRIC AND CUT THE PATTERN (FIG. 7)

Pin the pattern pieces to the fabric as shown in Fig. 7 and cut the different pattern pieces. The facing and the band for the side-opening of the skirt are to be cut from the small bits of fabric left over. Canvas or long cloth may be used as interfacing for the waist-band to keep it stiff.

Note :—In the diagram

R=Right
L=Left
Sl=Sleeve

Fig. 7 (Layout of pattern-pieces)



(A half-inch is allowed for ordinary seams and 1/8- inch for bands)

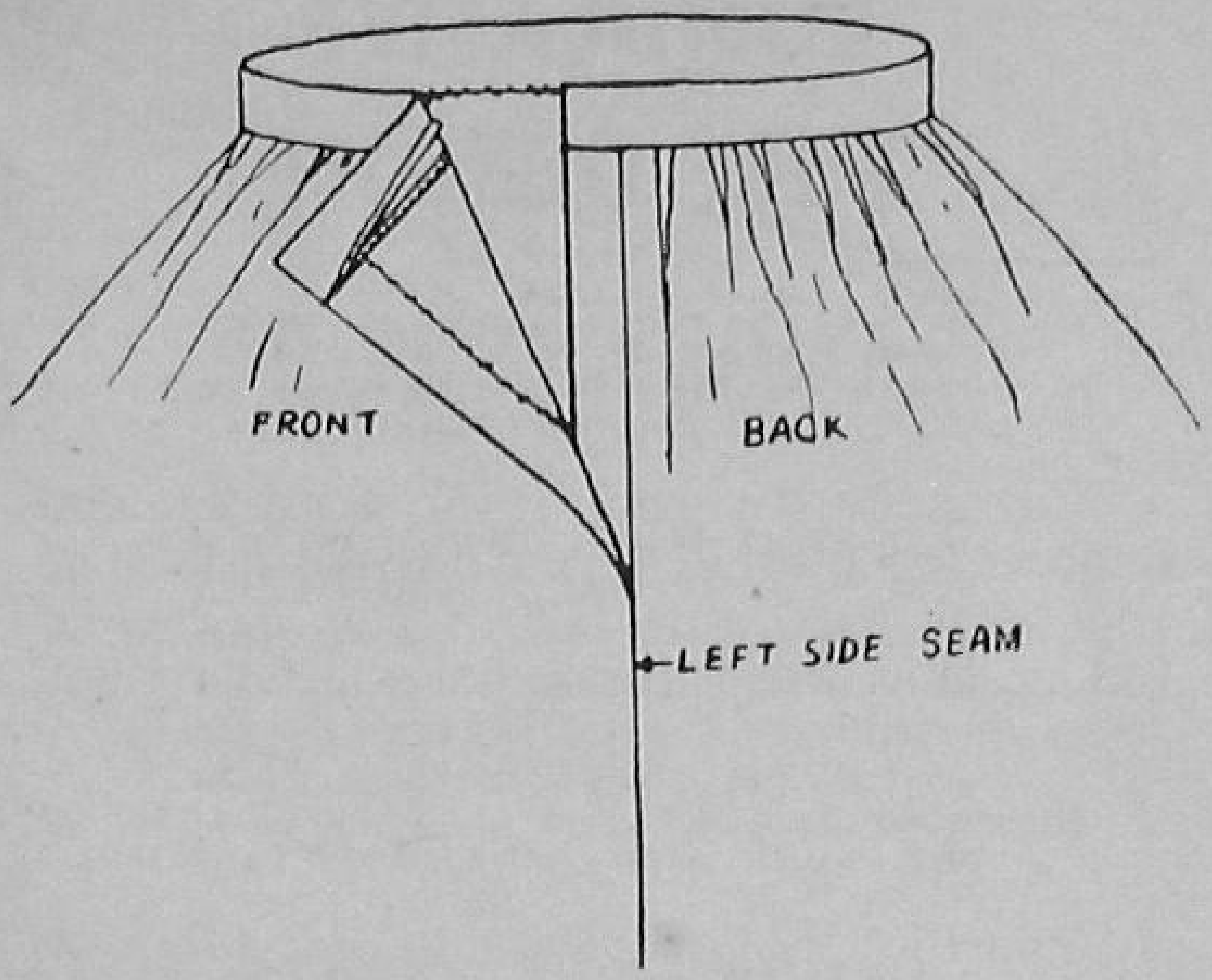


Fig. 8 (Side-opening of the skirt)

Skirt : For the skirt, join the two pieces 'A' and 'B' so that 'B' is below 'A'. Note that the border runs across the middle of the skirt. Make the side seam, leaving 3″ free below the waist-line to form the side opening which will be to the left of the skirt.

Make a facing along the edge of the opening of the front skirt and make a protruding band 1″ wide, along the edge of the opening at the back skirt. Place the facing over the band and secure them in position at the lower end with a few invisible stitches (Fig. 8). Gather the upper edge of the skirt to fit the waist. Note that the side placket is to be pinned in position before measuring the waist (a little extra fabric is allowed in the turnings of the waist-band for future adjustments).

Fix the canvas or long cloth interfacing inside the waist-band and attach it to the skirt. Sew the necessary hooks and eyes for the waist-band and the side-placket. The waist should be fitted tight.

Jumper : Make the shoulder seams and the side seams, leaving 2½″ free at the lower end of the left side seam for the side opening. Face the edge of the side opening of the front and make a protruding band at the back.

Fix the facing over the band and secure them in position at the top with a few invisible stitches (Fig. 9). Bind the opening down the neck. Face the lower-end of the blouse with a strip of material 1½″ wide.

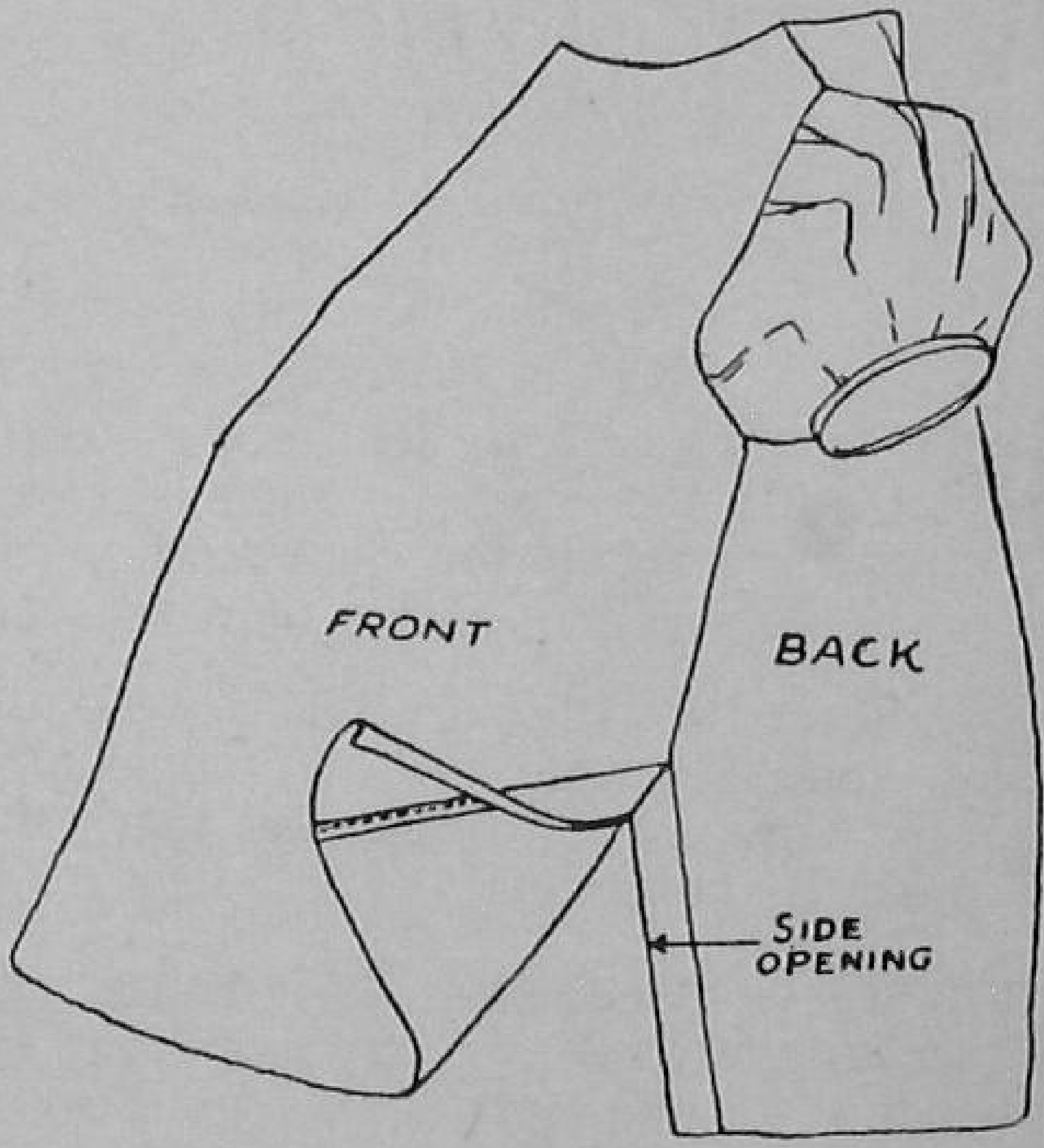


Fig. 9 (Side-opening of the jumper)

Gather the lower edge of each of the sleeves to fit the sleeve-band. Make the side seams and attach the bands to the sleeves. Leaving 2″ free from both ends, gather the sleeve-head to fit the armhole.

Attach the sleeves to the bodice of the jumper so that the side seams of the bodice and the sleeves match. The portion cut deeper in the sleeve-head should come to the front of the jumper (Fig. 10). Adjust the gathers at the sleeve-head evenly on both sides of the shoulder-line.

Place one collar over the other and join them together along the outer edge, allowing

½" for the seam. Turn the collar inside out and pin it to the neck so that the neck ends of the collar come to the edge of the binding at

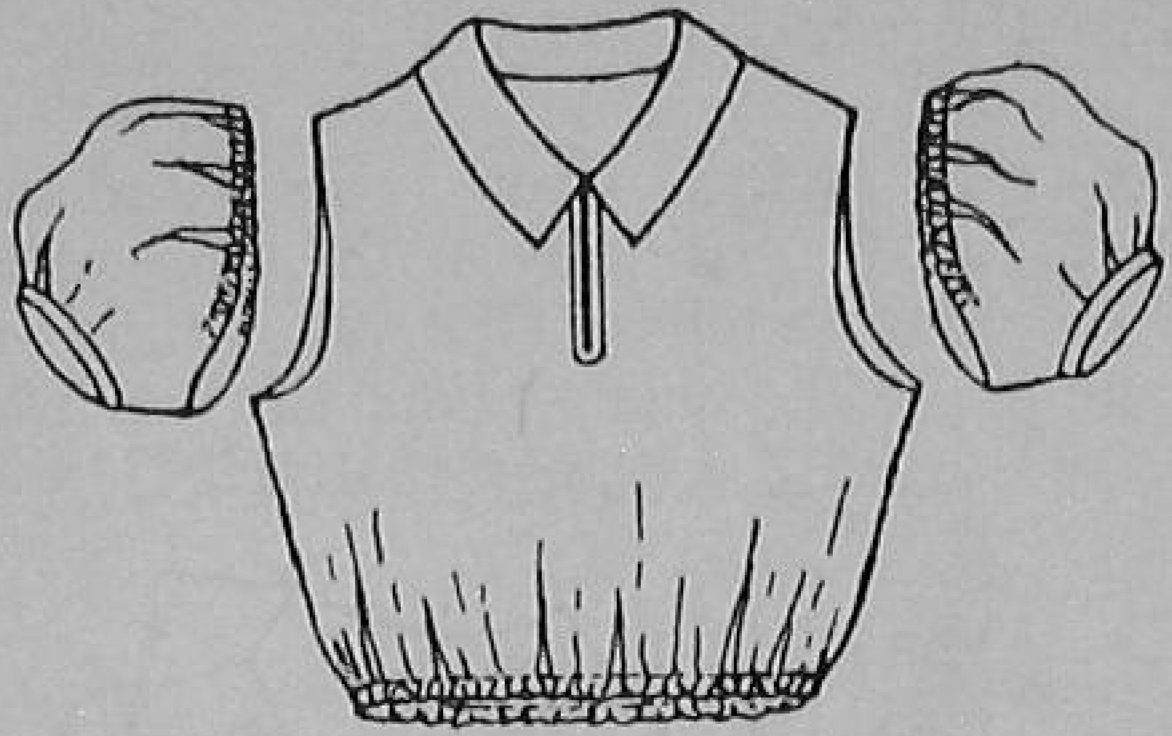


Fig. 10 (Bodice of jumper, sleeves placed side by side and elastic at lower end)

the neck opening and the centre of the collar coincides with the centre of the back neck. The circumference of the neck end of the collar will be slightly smaller than the neck of the jumper. This extra material must be adjusted neatly at the back of the neck for the good fitting of the collar. Fix the collar to the neck with a bias strip of material (Fig. 11). Sew the required number of buttons at the neck opening and the side opening and insert a piece of elastic at the lower end of the jumper to keep the waist tight (Fig. 10).

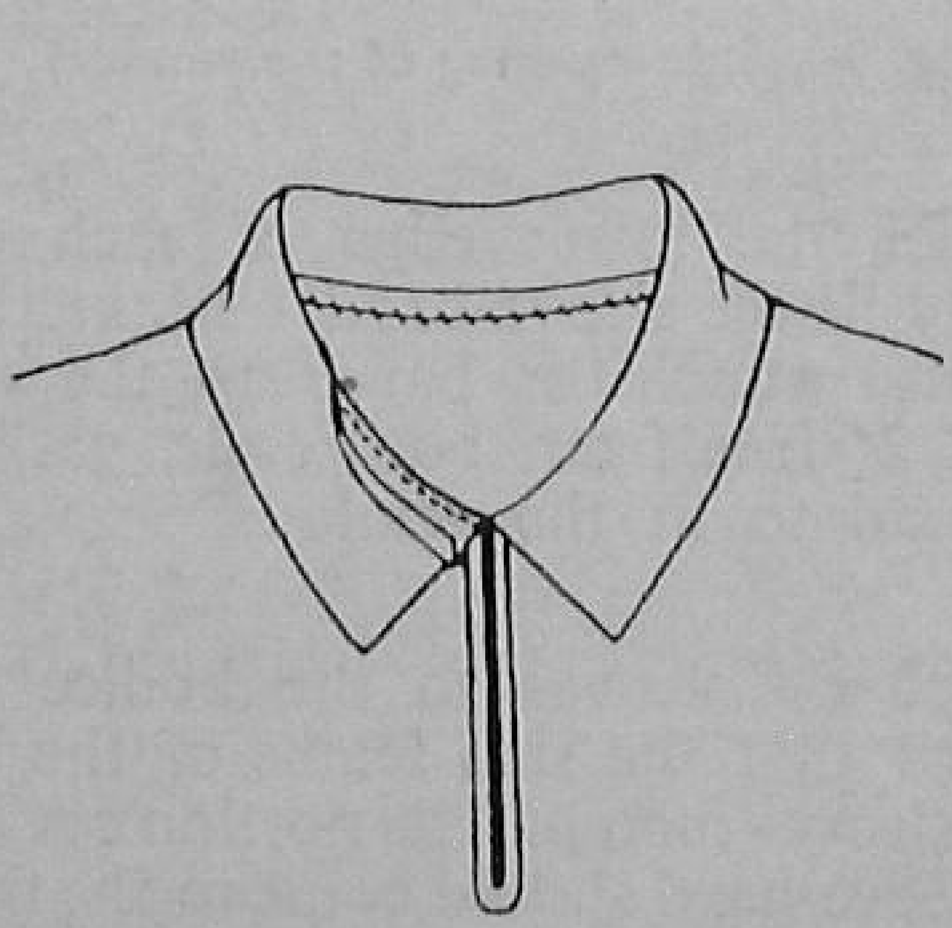


Fig. 11 (Attaching collar to the neck)

The remnant piece of the skirt may be used for making an underwear to match.

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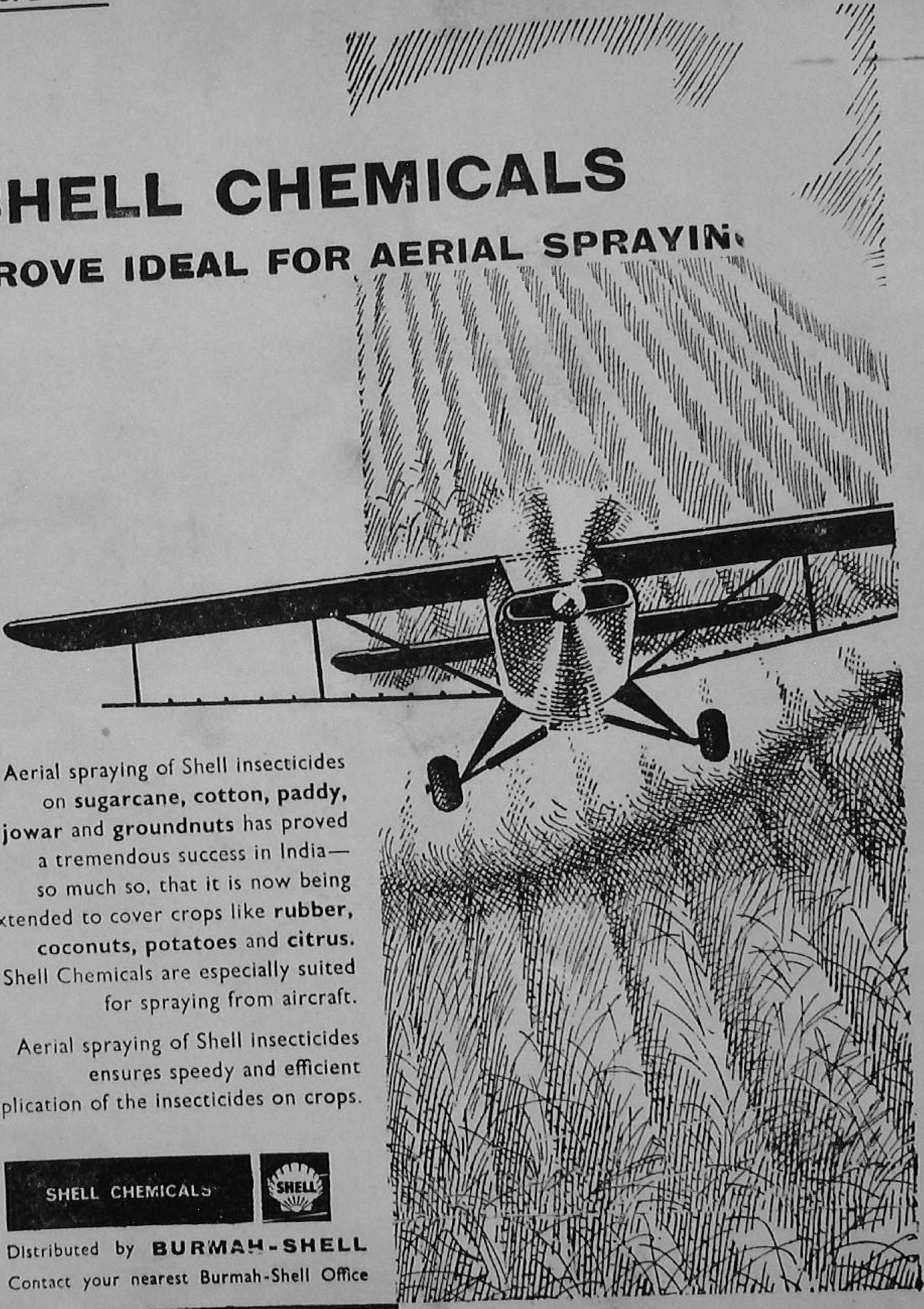

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EXTENSION

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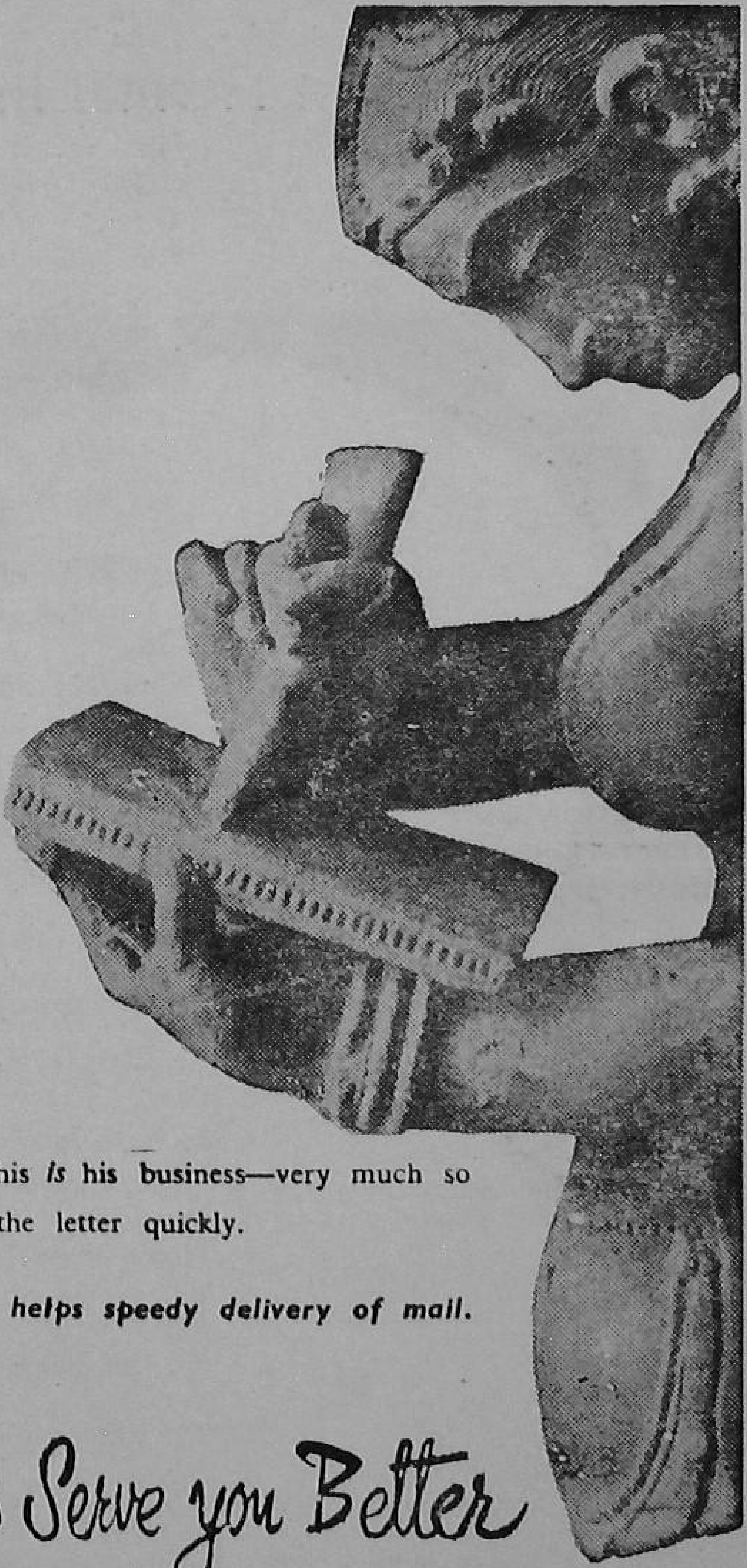
THE FARM AND FARM HOME MAGAZINE September, 1962

Special Wheat Number



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Vol. III SEPTEMBER 1962 No. 3

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Some new PUSA WHEATS

By B. P. PAL

THE Indian Agricultural Research Institute is one of the foremost centres of wheat breeding in India. The Institute was established as far back as in 1905 at Pusa in Bihar. That is why it is commonly known as the Pusa Institute, even when it was shifted from Pusa after the great earthquake of Bihar in 1934, to its present location in New Delhi. For the same reason, the wheats bred at this Institute became famous, both in India and abroad, as "Pusa wheats." Since the Institute came to New Delhi, the wheats have been called "N. P." (New Pusa) wheats.

Pusa 4 (now *N. P. 4*) was the first improved wheat variety of India. It was produced by the Institute in the first decade of this

century. This wheat covered extensive tracts, not only in India, but also in some other countries like Australia and southern Rhodesia. It won several prizes for grain quality in international grain exhibitions held in Canada.

Following the release of *N. P. 4*, the Institute produced several other wheat varieties such as *N. P. 12*, *N. P. 52*, *N. P. 80-5*, *N. P. 111*, *N. P. 114*, *N. P. 120*, *N. P. 125* and *N. P. 165*, each of which became very successful in one region or another. Thus, *N. P. 52* at one time became the most dominant wheat in Bihar and it also achieved considerable success in Bengal, eastern Uttar Pradesh and Madhya Pradesh. *N. P. 80-5* became popular in the hills of Uttar Pradesh and the Punjab, *N. P. 125* in the plains of Uttar Pradesh, and *N. P. 165* in Delhi and the adjoining areas and also in the Saurashtra area of Gujarat.

Several diseases attack the wheat crop in India. The rusts, of which there are three kinds—black, brown and yellow—and the looses mut are the principal ones among them. It is estimated that wheat crop worth about five crores of rupees is annually lost in India due to the rusts alone. In epidemic years, which are not infrequent, the losses are far heavier.

There is no effective and cheap way of controlling the rusts except for the use of disease-resistant varieties. The loose smut can be controlled to some degree by subjecting the grain to hot water treatment. But this treatment is bothersome and it cannot be said to be wholly effective when done on a large scale; here also, therefore, the use of loose smut-resistant varieties gives the most effective control of this disease and, from the farmers standpoint, it is quite an inexpensive way of combating the disease.

Therefore, the work of breeding disease-resistant wheat varieties was taken up at this Institute, for the first time in India, in 1935. As a result of this work, a number of wheat varieties, which are fully resistant to loose smut and are either tolerant or resistant to the rusts, have been produced. This work has been in progress at the Headquarters of the Institute at New Delhi and at five of its substations, located at Simla and Bhowali in the northern hills, at Pusa in Bihar, at Indore in Madhya Pradesh and at Wellington in the Nilgiri hills in Madras State.

In India, three major types of wheat are under cultivation: (1) the common bread wheat (*Triticum aestivum*, previously known as *T. vulgare*) which accounts for about 90 per cent of the wheat area in India; (2) the hard or macaroni wheat (*T. durum*) which is mostly grown in Central and Peninsular India, and (3) the *samba* or *khapli* wheat (*T. dicoccum*) which occupies only a few thousand acres in the Nilgiri and Palani hills and in small pockets elsewhere. The sub station at Indore is devoted primarily to the breeding of rust-resistant varieties of *durum* wheat and that at Wellington, of *samba* or *dicoccum* wheat.

PRINCIPAL N. P. WHEATS

The principal among these *N. P.* varieties, which have already covered extensive areas in the country, and some newer *N. P.* wheat varieties are described below:

N. P. 710 : Loose smut-resistant and rust tolerant ; medium in maturity ; ears bearded. Suitable for western and central districts of U. P., West Bengal, Koraput and other hilly areas of Orissa, south Bihar, northern Madhya Pradesh, the Marathwada area of Maharashtra, Gujarat and Andhra Pradesh.

N. P. 718 : Loose smut-resistant and rust-tolerant; early maturing ; ears bearded. Suitable for Delhi, south-eastern Punjab, south-eastern Rajasthan, Gujarat, the Marathwada area of Maharashtra, the Nimar area of Madhya Pradesh, western U. P. and plains of Orissa.

N. P. 720 : Although susceptible to loose smut and rust, it is recommended by the U. P. Department of Agriculture, owing to its high-yielding ability for the medium-fertile soils of the Tarai region.

N. P. 761 : Loose smut and yellow rust-resistant ; early maturing : ears bearded. Suitable for Bihar, in the non-irrigated tracts of Saran; Muzaffarpur and Darbhanga Districts for normal sowing and in *tal* and *chaur* lands for late sowing.

N. P. 798 : Loose smut and black rust-resistant ; early maturing ; ears-tip awned. It has become very popular in Bihar and West Bengal, especially after the rust epidemic of 1956-57. Also suitable for eastern U. P., plains of Orissa and the Saurashtra area of Gujarat.

N. P. 770 : Loose smut and yellow rust resistant ; medium-late in maturity ; ears bearded and attractive. Suitable for higher elevations (7,000 ft. and above) in the hilly regions of Himachal Pradesh, U. P. and West Bengal.

N. P. 809 : Resistant to loose smut and to a large number of physiologic races of all the three rusts ; late maturing ; ears-tip awned. Suitable for medium to high elevations (between 5,000 and 7,000 ft.) in the hilly regions of Himachal Pradesh, Jammu and Kashmir, U. P. and West Bengal.

Ridley : Introduced by this Institute from Australia. It has good standing ability, attractive and compact, beardless ears and bold grains. Partially rust-resistant and susceptible to loose smut ; yet it has become very popular in the lower hills of Himachal Pradesh, Punjab, U. P. and West Bengal.

N. P. 792 : A very early maturing variety, resistant to loose smut and black rust. It has been found suitable in the Paonta Valley of Himachal Pradesh and is also recommended for sowing after late paddy harvests in the northern hilly region.

NEWER N. P. WHEATS

a) Bread wheat varieties :

N. P. 823 : Loose smut and black rust resistant and partially resistant to yellow rust ; early maturing ; ears bearded, somewheat prone to shattering if the crop is left long in the field at maturity ; grains bold and attractive. Suitable for soils of average and high fertility, and also for early and late sowing in Delhi State and adjoining areas.

N. P. 824 : Loose smut and black rust resistant and partially resistant to yellow rust ; medium maturity ; good tillering and standing ability ; ears bearded, long and attractive. In tests on grain quality recently conducted in Canada, it was adjudged as being the best among the Indian wheats. Suitable for rich soils with good irrigation facilities. It has shown very wide adaptability and has done very well in Delhi, U. P., Bihar, West Bengal, Orissa, Gujarat, Maharashtra and Mysore.

N. P. 825 : Loose smut and black rust resistant and partially resistant to yellow rust ; medium maturity ; ears bearded. Has done very well in western U. P., Punjab and Rajasthan. In Rajasthan, it has been recommended by the Department of Agriculture for cultivation in the Sriganganagar area.

N. P. 829 : Fairly resistant to all the three rusts and to loose smut. Suitable for cultivation in the lower hills of U. P., Himachal Pradesh and Jammu and Kashmir, in preference to *Ridley* in areas where varieties earlier in maturity than *Ridley* are needed.

N. P. 832 : A black rust-resistant variety, possessing *Pissi*-type soft grains. Very suitable for cultivation in the Malwa region and adjoining tracts in Central India where *Pissi* wheats are commonly grown.

N. P. 830: Resistant to yellow rust ; susceptible to loose smut and the other two rusts ; medium-early in maturity ; ears bearded; grains bold and attractive; the crop stands up very well under high soil fertility conditions because of its medium-tall plant height. Has done very well both in normal and late sowings. This variety has given in recent trials a very good performance in Delhi, western U.P., and parts of Rajasthan and the Punjab.

N. P. 835: Resistant to yellow and brown rusts and partially resistant to black rust; susceptible to loose smut; early maturing; ears bearded. In recent trials, it has given promising results in eastern U. P., Bihar, West Bengal and Orissa.

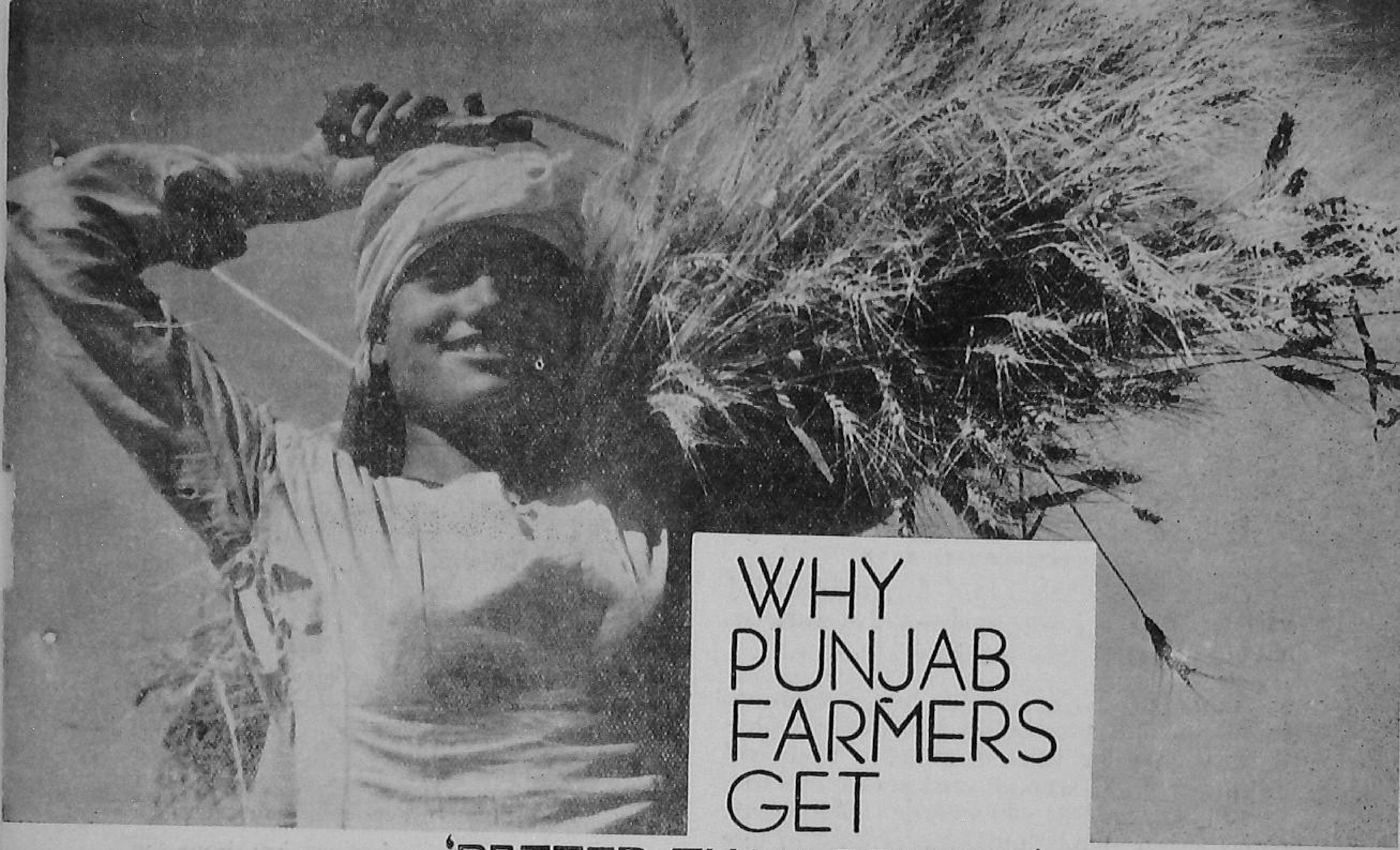
N. P. 836: This is a bearded wheat produced by irradiation of a beardless rust-resistant variety—N.P. 799—a sister selection of N. P. 798. In the recent preliminary trials at Pusa in Bihar, it out-yielded N. P. 798.

b) Rust-resistant *Khapli* or *samba* wheats (*T. dicoccum*)

For cultivation in the Nilgiri and Palani hill area of Madras State, and in adjoining tract where *samba* or *khapli* wheats are grown, the black and brown rust resistant variety, *N. P. 200*, has been found to be very suitable and is recommended. This variety has bolder grain, higher protein content and higher grain to-husk ratio as compared to the local *samba* wheats.

c) Rust-resistant *durum* wheats:

The indigenous *durum* wheats of India are all-rust susceptible and no resistant variety was so for available. Recently, a number of black and brown rust-resistant *durum* varieties, possessing bold and very attractive grains, have been developed by this Institute. In the preliminary trials conducted in Central India, some of these, especially *N. P. 403*, *N. P. 406*, *N. P. 407* and *N. P. 401*, have given excellent performances and appear be very promising.



WHY PUNJAB FARMERS GET 'BETTER THAN BEFORE' WHEAT YIELDS

By PRITAM SINGH DIOL AND GURCHARN SINGH

GOOD cultural practices, better crop rotations, adequate manuring, timely measures against pests and diseases and improved varieties—these, in short are the key points of successful wheat cultivation in the Punjab—where production has gone up by nearly 250 per cent since 1947, with the result that the Punjab is once again the 'Granary of India.'

The hints on better wheat cultivation suggested to the Punjab farmers by the Department of Agriculture, Punjab, will be of interest to farmers elsewhere also

SELECT THE SUITABLE SOIL

Wheat grows on all kinds of soils excepting alkaline and water-logged ones.

Medium loam soils, however, are the best for wheat.

PREPARE THE LAND WELL

The better you prepare the land the better will be the wheat crop.

Plough the land with a *desi* plough eight to ten times in rainfed areas. In irrigated lands give the first ploughing with a furrow-turning plough and follow it up with four to five ploughings with a *desi* plough. Run a *sohaga* (the wooden leveller) after each ploughing. This will give a fine tilth and conserve moisture in the soil.

USE A PROPER SEED-RATE

Use a higher seed-rate for bold-seeded varieties and a lower seed-rate for varieties having a higher tillering capacity.

You will have to use the higher seed-rate in case of late sowing, in lands of a higher fertility and in rainfed areas. You will require 28 to 32 seers of seed per acre in irrigated lands and 36 to 40 seers in rich irrigated soils, *barani* lands and also in case of late sowings.

SOW AT THE RIGHT TIME

The best period is from the middle of October to the middle of November. In the south eastern districts of the Punjab sow in the latter half of October and in the central zone in the first half of November. You can sow even up to the end of November in the sub-montane and hilly areas.

If you are going in for late sowing, you can do it up to the middle or the third week of December with good results. You can, do the sowing even up to the end of December though.

In Lahaul valley, wheat is grown as a summer crop in April and May when the snow melts away.

HOW TO SOW

If yours is a big holding and you have prepared the seed-bed well, use a *rabi*-drill for the purpose.

But in case yours is a small holding, sow by *kera* method (dropping seed by hand after ploughing) in irrigated lands and by *pora* method in rainfed areas.

Do not run the *sohaga* after sowing by the *pora* method as it badly affects germination; but you have to run the *sohaga* in the *kera* method to cover the seeds with the soil. Follow it up with harrowing, using a bar harrow to produce necessary mulch which will conserve soil moisture, ensure a good germination and delay *kore* (first) irrigation.

CROP ROTATION TO FOLLOW

In normal cases, two weedings, one before and one after the *kore* irrigation will be sufficient. If there is labour available, you can give one interculturing in place of weeding after the *kore* irrigation.

You will also find a bar harrow useful for keeping down weeds. Use it after a shower of rain in rainfed areas, and after *kore* irrigation in irrigated areas.

WHEN TO HARVEST AND HOW TO THRESH

Wheat is ready for harvest by about the end of March in the south-eastern zone where the season ends up early and hot dry winds start blowing by the time.

In the central and sub-montane regions, the crop is ready in the second week of April; in Kangra Valley in May and in the Kulu sub-division in June and in Lahaul Valley (over 10,000 feet high) at the end of October. The crop is generally harvested by hand and threshed by either treading or by dragging the *phallas* behind the bullocks.

Winnowing is mostly done by hand to separate the grain from the *bhusa*.

DO NOT FORGET INTERCULTURING

It is only in the rainfed areas that wheat is grown after keeping the land fallow during the *kharif*. Elsewhere wheat always follows a *kharif* crop.

In the central districts, wheat follows cotton, rice or maize; in sub-montane and hilly tracts, it comes after rice, maize or a pulse crop; whereas in south-eastern districts,

it is grown after *bajra* and in *barani* lands after *chari* also.

As all the *kharif* crops, excepting the pulses, exhaust the land it is a good practice to manure the wheat fields well to get good yields.

USE MANURES AND FERTILIZERS

Experiments show that a dose of 50 pounds of nitrogen to an acre in the form of ammonium sulphate increases the wheat yield by as much as 50 to 60 per cent even in the poor soils of Gurgaon District. You can also use, in addition to this fertilizer, farmyard manure and green manure. You should grow a green manure crop during the *kharif*.

CONTROL WHEAT DISEASES

1. *Loose smut :* Commonly known as '*kanghiari*', loose smut turns the wheat grains into black powder.

In the plains, the solar heat treatment of wheat seed controls the smut completely. In the hills, however, where the heat of the sun is not so intense, give your wheat seeds the hot water treatment.

2. *Flag smut :* It is very difficult to control flag smut completely; for the disease is both soil-and seed-borne. It is particularly serious in the sub-montane regions.

You first notice the disease when long narrow lead-grey streaks appear on the leaves. The affected plants seldom produce any seed.

Control the disease with copper sulphate solution at 2 *chhataks* for every maund of seed. 'Ceresan' or 'Agrosan GN' used in the ratio of 1 for 400 parts of seed is equally good; but copper sulphate is much less poisonous.

3. *Hill bunt or stinking smut :* It is mainly confined to the Kangra District.

To control the disease, treat the seed with 'Ceresan' or 'Agrosan GN' Use one pound of the chemical for five maunds of seed.

If however, you, sow the crop early, it will be free from the disease to a great extent. If you raise the crop from the seed obtained from the plains, the crop will not be attacked by bunt in the first year.

4. *Earcockle :* Locally known as *mamni*, the disease is found all over the State but is particularly serious in the Districts of Kangra, Rohtak, Karnal and Hissar.

Remove the infected grains (the earcockle galls) by dipping in a bucket of water. This you can easily combine with the anti-smut solar heat treatment when the seed is first soaked in water for about four hours. Destroy the galls preferably by burning.

5. *Foot-rot :* The disease is common in *barani* areas, especially where the crop is sown early and the temperature is comparatively higher; the disease attacks and kills the seedlings in early stages. The cause of the death of seedlings is often mistaken for the attack by white ants.

Sow the seed when the weather has cooled down sufficiently. Under *barani* conditions, this is possible if the soil moisture has been sufficiently conserved by dry farming practices. Where irrigation water is available, a good *rauni* (irrigation before sowing) irrigation of about four inches will keep the disease fairly under control.

6. *Rusts :* All the three rusts—black, brown and yellow—attack the crop. The only way to control them is to use rust-resistant varieties.

CONTROL PESTS ALSO

1. *White ants :* Give a light irrigation which will help control this pest. You can also use Gammexane at 15 seers per acre at the time of sowing. This will control the pest effectively.
2. *Cutworms :* Early sown crops are sometimes attacked by cutworms, a very destructive pest. Sow the crop when the season is milder. You can also use BHC. dust to control the pest.

Storage pests : *Khapra* and *susri* are the two important storage pests. To control these pests.

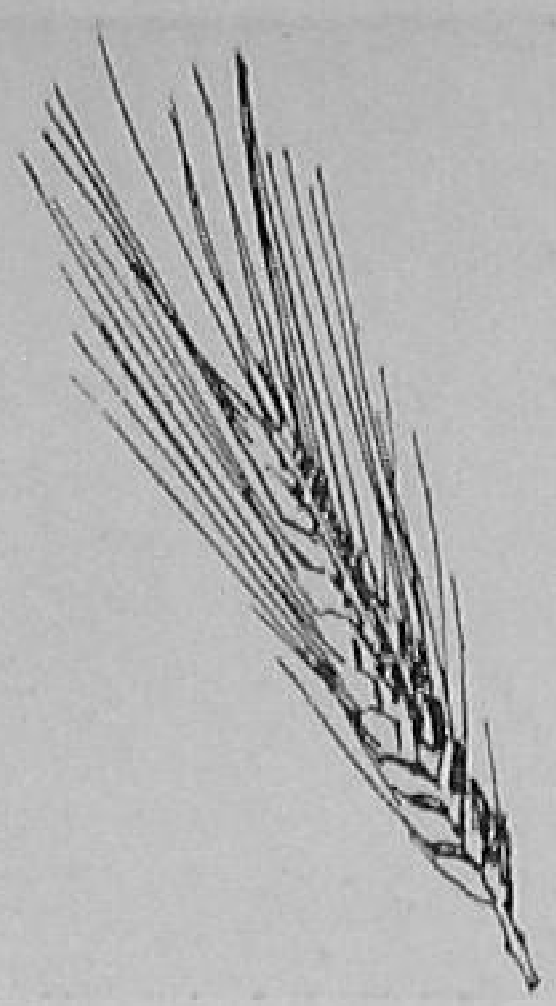
1. Store wheat in clean and disinfected godowns.
2. See that you do not use old infected gunny bags.
3. Fumigate your godown with E.D.C.T. mixture (20 pounds of E.D.C.T. mixture for 1,000 cubic feet) and HCN (1 pound sodium cyanide and 1½ pounds of sulphuric acid per 1,000 cubic feet):
   Dust five per cent BHC on the walls, on the floor and ceilings of godowns.
4. You can also treat the wheat seed with Gammexane at one *chhatak* per maund. This way you can prevent the attack from all insects. *But remember that Gammexane-treated seed is not fit for consumption.*

Follow these cultural practices and......

USE IMPROVED VARIETIES

Improved varieties alone can increase the yields by as much as 15 to 20 per cent. See which one of these is best suited to your area.

1. *Varieties*	C.253	C.281	C.273	C.285	C.286
2. *Region for which recommended*	Hilly areas, especially of Kangra and Kulu Valleys.	South-eastern dry Hariana tracts.	Central and sub-montane tracts of the State.	Lahaul and Spiti District at 10,000 to 11,000 feet altitudes.	Sub-montane tract and lower altitudes of Kangra District. For late sowing in the central districts also.
3. *Condition of sowing under which recommended*	All types of sowings in hilly tracts of the State.	All types of sowings in the south-eastern districts.	Timely sowing; high and average fertility; irrigated areas in central zone and high fertility, irrigated areas in sub-montane tracts.	Under irrigated and rainfed conditions.	For all conditions of sowing except in rich lands in the sub-montane tracts and for late-irrigated areas in the central districts.
4. *Average yield per acre in maunds*	15 to 30	15 to 40	22 to 45	14 to 20	18 to 23
5. *Remarks*	Resistant to yellow rust and loose smut.	Renowned for attractiveness of the grains.	Reputed for high yield and shapely grains; has got wide adaptability.	Being resistant to diseases, has become popular.	Highly resistant to all the rusts and loose smut.



By H. G. SINGH

FOR A BETTER WHEAT YIELD IN BIHAR

IN BIHAR, farmers grow wheat on 14,59,000 acres and collect 3,98,000 tons of grain a year. Research over a number of years in the State has shown better ways of growing wheat, which the Extension people are trying to pass on to the farmers.

Below are the main recommendations :

PREPARE THE LAND WELL

Wheat needs a well-prepared bed for sowing. Therefore, pulverize the soil well, but not to the extent of making it too fine like dust. Apply compost next.

The way, you are going to prepare the land, however, will depend on the soil condition, the crop rotations followed and on whether you are raising the crop irrigated or rainfed.

If you have kept your land fallow during the monsoon, and particularly if your soil is alluvial, plough and cross-plough eight to ten times, but not more than that. Give one or two ploughings during the monsoon and the rest after the monsoon. Follow the ploughings by working a beam, also known as *henga*.

In case you are green manuring the land, do it in the first half of August. You can start your ploughings after a month of burying the green manure.

USE IMPROVED SEED

Select a variety best suited to your area. *N.P. 798* and *N.P. 799* are good for all areas in Bihar.

For late sowing in *tal*, *chaur* and *diara* lands, use the early variety, *N.P. 761*.

Some of new improved wheat varieties

For Patna, Gaya, Shahabad, south Monghyr and south Bhagalpur area, *N.P. 710*, a mid-seasonal variety, is also suitable.

For Tirhut region, *N.P. 761* is suitable for normal sowing.

Use 20 to 30 seers of seed to an acre, if the seed is healthy and can germinate well.

WHEN TO SOW AND HOW

Sow the seed from the first to the third week of November. Experiments show that the middle of November is the best time for sowing.

Experiments also show that if you at all have to delay your sowings, you can do it till the first week of December and even get yields up to 15 maunds per acre provided there is enough moisture at the time of sowing and also if you use varieties like *N.P. 798* or *N.P. 799*. Do not sow before the first week of November, however, if you are in the north or south Bihar, for most of the plants die off due to the heat at that time.

In Chhotanagpur, where the temperature comes down earlier and the moisture is lost quicker, you can sow from mid-October to early November to make use of the available soil moisture.

WHAT MANURES TO USE

Apply 150 to 200 maunds of compost or farmyard manure. If you cannot get them, you can grow a green manurer crop like *akawan* on field bunds or in othe places you can spare.

You can also grow *moong* or *kalai* mixed with maize. This way you can get a green manure for wheat without losing a crop during the *kharif* season.

It is a good practice to apply 1½ to 2 maunds of single superphosphate per acre while sowing green manure seed.

Sow wheat only after the green manure plants are completely decomposed.

WHICH FERTILIZERS TO APPLY

If you are not using any organic manure you should apply 200 pounds of ammonium sulphate and 260 pounds of single superphosphate per acre. This a is general dose, and for exact amounts of fertilizers to be applied in your area, see the, box.

In heavy soils, place the fertilizers, both nitrogenous and phosphatic below the seed. In case the soil is light, broadcast the nitrogenous fertilizer. Better apply the nitrogenous fertilizer in two doses, the first one at the time of sowing and the second a month after, when irrigating the field.

WHEN TO IRRIGATE

If you find that there is not enough moisture in the field you should give an irrigation even before sowing. This will help the seed germinate well.

After the first pre-sowing irrigation, give another two or three, three acre-inch irrigation. Give them at the time of tillering (three to four weeks after sowing), just before flowering and at the milk stage. This will help you get good crop.

WHAT ROTATION TO FOLLOW

Follow any one of the crop rotations, depending of course on the conditions in your area.

- Paddy (early)—wheat (irrigated areas)
- Green Manuring—wheat (irrigated areas)
- Paddy—wheat (irrigated), green manuring—sugarcane.
- *Urid Moong*, Cowpea, Maize (alone or mixed)—Wheat.
- Maize—wheat—Green manure—Sugarcane
- Maize-potato, Sugarcane-Green manure crop—wheat alone or mixed with gram.
- Fallow—wheat (in *Tal*, *Chaur* and *Diara* areas, without irrigation)
- Early paddy or *marua* or maize-wheat alone or mixed with gram.

MIXED CROPPING

In areas where water for irrigation is not available, wheat is usually sown mixed with some other crops like gram, peas, and mustard. Experiments show that wheat and gram mixed in the ratio of 2:1 give good results.

INTERCULTURE

Use a zig-zag cultivator or a peg-tooth harrow before sowing. This simple implement is very good for collecting the uprooted weeds.

Wheat variety *N.P. 799* grown in a three-year rotation, yields 20 maunds an acre

Use a light hand-hoe for intercultivating the crop, It is handy, cheap and very useful.

You can also control broad-leaved weeds by spraying the crop with 'Fernoxone' one pound dissolved in hundred gallons of water. It is economical too.

You should also run the light peg-tooth harrow or bar harrow over the field. This will loosen the soil, create a fine mulch and help get a better tillering. In Uttar Pradesh, it resulted in as much as ten per cent increase in the yield.

Wheat variety *B.R.319*, grown in a three-year rotaion, yields 16 maunds an acre

ROGUE OUT OFF-TYPES

Remove all off-type plants so that you get pure seed. Also collect smut-infected plants and burn them.

Loose smut, karnal bunt, flag smut, foot rot and rusts (yellow, brown and black) are some of the major diseases which attack the crop.

One way to prevent the attack of loose smut is to use disease-resistant varieties,

Wheat variety *N.P. 798* grown by the transplantation method at Bikramganj Farm, Shahabad

namely *N.P. 710*, *N.P. 798*, *N.P. 799* and *N.P. 761*.

To prevent foot rot, treat your seed in a seed-dressing drum with 'Agrosan GN' at 1¼ *chattaks* per maund of seed just before sowing.

Termites are a great enemy of the crop. They attack the roots of plants and kill them. To control termites :

1. Apply 5 per cent BHC at 20 to 25 pounds per acre in termite-infected soils at the time of sowing. This will cost you only three rupees an acre.
2. In case irrigation water is available in your area, irrigate (in a mild attack) or flood (in a severe attack) the infested field. Apply crude oil emulsion at 1 to 1½ gallons per acre along with irrigation water.

Cutworms are the most dangerous enemy of wheat. The caterpillars start damaging the crop as soon as they come out of the eggs. They hide under the soil during the day, and come out in the evening to cut the plants and feed on them. You can find the eggs on the plant leaves.

To control cutworms :

1. Treat the field with 5 per cent 'Aldrin' at 25 pounds per acre, while preparing the land for sowing, in areas where they attack every year.
2. In the early stages of attack, you can also dust the plants with 5 per cent DDT at 20 to 25 pounds per acre.
3. In case the attack is very heavy, dust the plants with 5 per cent 'Aldrin' at 30 pounds per acre.

WITH WHAT TO HARVEST AND THRESH

A sickle is all you need for harvesting if you have a small field. A bullock-drawn or tractor-drawn reaper will be useful in large-scale farming. A disc harrow worked with a light tractor will cost you only Rs. 35 to 40 for a ten-hour operation. Within this time it separates nearly 50 to 80 maunds of grain without any breakage or loss in the quality of the grain.

Spraying wheat variety *B.R. 319* against pests

For threshing, use the Olpad Thresher, (costs about Rs. 150) which does the job in less than half the time required by bullocks.

STORAGE

Clean the grain and dry it completely before storing. Also get the godowns cleaned, fumigated and dried before the seed is stored there.

Of course, pucca godowns and metal bins the are best for storage, but you can also use earthen bins for the purpose. See that all cracks, crevices and holes in the store room or in the earthen bins are closed.

Disinfect the godowns, bins and bags by spraying with 0.25 per cent DDT.

Mix the grain with 'Pyrodust' (a powdered wheat base containing 1.1 per cent Pyroxyl butoxide and 0.8 per cent Pyrethrin) at hundred pounds for every thousand maunds of grain.

These are the pests which attack the grain during storage. Some of these are:

Rice weevil
Lesser grain borer
Common flour bettle
Saw-toothed beetle
Khapra

Immediately you notice any of these pests in your grain, take the following measures:

1. Dust the grain bags with 5 per cent BHC.
2. Fumigate the grain with Ethylene dichloride carbon tera-chloride (EDCT) at 30 pounds per thousand maunds of grain.

Have this done only by an expert as it is a very dangerous operation.

HOW MUCH FERTILIZER TO USE IN BIHAR

	WHERE	HOW MUCH	
1.	Hajipur, chapra Sadar, Begusarai, Kishenganj, Aurangabad,Buxar, Dumka Jamui	S/A 3 mds.	+ S.S.P. 3 mds. + M/P. ½ md.
2.	Muzaffarpur Sadar, Siva Purnea Sadar, Katihar, Khagaria, Arrah Sadar, Moghyr Sadar	S/A 3 mds.	+ S.S.P. 1½ mds. + M/P. ½ md.
3.	Gopalganj, Motihari, Bettiah, Supaul, Patna Sadar, Barh, Biharsharif, Banka,Godda and Sahebaganj	S/A 1½ mds.	+ S.S.P. 3 mds. + M/P ½ md.
4.	Darbhanga Sadar, Dinapur. Jahanabad, Bhagalpur Sadar, Pakur, Jamtara, Ranchi Sadar, Latehar,Baghwara, Daltonganj, Garhwa, Dhanbad, Hazaribagh Sadar, Saraikela Tatanagar	S/A 1½ mds.	+ S.S.P. 1½ mds. M.P ½ md.
5.	Gaya Sadar and Sherghati, Simdega, Khunti, Gumla, Sasaram, Madhubani	S/A 1½ mds.	+ S.S.P. 1½ mds.
6.	Saharsa, Deoghar, Chetra	S/A 3 mds,	+ S.S.P. 3 mds.
7.	Sitamarhi.	S/A 3 mds.	+ S.S.P. 1½ mds.
8.	Samastipur and Bhabhua.	S/A 3 mds.	+ S.S.P. 1½ mds. + M/P 3 mds.
9.	Chaibasa	S/A 1½ mds.	+ S.S.P. 3 mds. + M/P 1 md.
10.	Nawadah	S/A 1½ mds.	+ S.S.P. 1½ mds. + M/P 1 md.
11.	Giridih	S/A 1½ mds,	+ S.S.P. 3 mds

S/A = Sulphate of Ammonia
S.S.P. = Single Superphosphate
M/P = Muriate of Potash

IN UTTAR PRADESH, IT IS THE 'U.P. METHOD' YOU SHOULD TAKE UP

UTTAR PRADESH FARMERS HAVE HARVESTED THIS YEAR 90 LAKH TONS OF WHEAT. TEN YEARS AGO, IT USED TO BE 25 LAKH TONS. EVEN SO, EXPERTS FEEL THE AVERAGE YIELD OF 11 MAUNDS AN ACRE IS TOO LOW. THEY BELIEVE FARMERS CAN TAKE IT UP TO EVEN 50 MAUNDS, IF THEY TAKE TO THE 'U.P. METHOD'. HERE IS WHAT THE METHOD IS.

By Y. R. MEHTA

SELECTING THE SOIL

You can grow wheat in all types of soil excepting on sandy soils of the alluvial plains of the State and *raker* soils in Bundelkhand. Of course, your best selection would be a well-drained loam.

PREPARING THE SEED-BED

If you are green manuring the field, give the first ploughing with a heavy soil-turning plough like Victory, Punjab or Gurjar plough. Follow it up with three or four workings with a cultivator. Turn in the green manure by the middle of August.

If you are not green manuring your field, give the first ploughing with a light soil-turning plough. Follow it up with four to five workings with a cultivator. This will help produce a fine seed-bed.

In case you are using a country plough, give 10 to 12 ploughings and cross-ploughings in non-green-manured fields and 6 to 9 ploughings in green-manured fields.

In either case, use a *patela* after every cultivation.

You should plough the land either in the early morning or in the evening. Also see to it that you preserve the moisture well.

MANURING THE FIELD

Wheat, to yield well, must be given 50 pounds of nitrogen, and 40 pounds of phosphoric acid together with organic manures.

Experiments show that to get quick results there is nothing like giving a nitrogenous fertilizer combined with a phosphatic fertilizer. The crop responds as much as four times to such a mixture, which has both nitrogenous and phosphatic fertilizers, than to nitrogenous fertilizer alone. For exact requirements, follow the following schedule.

BASAL MANURING

For the wheat taken after fallow or as a kharif crop. In case you are not green manuring the field, manure with a hundred maunds of well-rotted farmyard manure at least a month before sowing.

During the final ploughing, give 18 to 20 pounds of nitrogen and 9 to 10 pounds of phosphoric acid. In case phosphates are lacking in your soil, you can double the dose of phosphoric acid.

You can apply the nitrogen in the form of calcium ammonium nitrate or urea or ammonium sulphate or ammonium sulphate nitrate, and phosphates as superphosphate or a mixture of superphosphate and bonemeal, in equal parts by weight.

If you are unable to give sufficient farmyard manure, increase the dose of fertilizers accordingly. A hundred maunds of farmyard manure supplies about 20 pounds of nitrogen and 10 pounds of phosphoric acid.

Wheat grown after green manuring : Sow a green manure crop by the end of June or the first week of July. Turn it in by the middle of August.

In well-drained sandy loams and loam soils, choose *sanai* and sow it at 40 seers per acre. In water-logged fields, grow *dhaincha.* Use 40 seers of *dhaincha* to sow an acre and turn it in after seven weeks.

Where irrigation water is available, sow *Moong T. 1* or *Urd 9* and *Lobia T. 2* with a *palewa* at eight seers per acre.

In lands which are less fertile or where the green manure crop does not come up well, give a fertilizer mixture containing 12 pounds of nitrogen and 6 pounds of phosphoric acid as a basal dose.

In case the fertilizer mixture of nitrogen and phosphoric acid is not available, broadcast the nitrogenous fertilizer at the time of last ploughing and 100 to 150 pounds of superphosphate just before sowing the wheat. Apply this in furrows, behind the plough at a depth of about three inches through a *nai* in the same row or in a separate row two inches away from the seed-row.

TOP DRESSING WITH FERTILIZERS

Normally, in a fertile soil, no more manuring need be done. But if it rains too much and particularly in light soils where the crop appears to be quite pale and yellow or is stunted in growth, give 50 to 60 pounds of

calcium ammonium nitrate or ammonium sulphate or an equal quantity of urea or ammonium nitrate at the time of second irrigation in December.

SOWING THE SEED

To get high yield of better quality wheat, use an improved variety. It is better to dust the soil before sowing with 20 to 25 pounds of 5 per cent BHC. For, then your crop will be free from white ant attack.

Start sowing by the last week of October and complete it by the first week of November. This is very important; for a late-sown wheat does not give as good a yield as a timely-sown one.

Sow 80 pounds of seed per acre; but in case yours is a fertile land and there is good moisture in the soil, you can sow 60 pounds only.

Sow the seed in straight rows, 9 inches apart, behind the plough. See to it that the seed is sown at a uniform distance in the rows.

It is good to have a wheat nursery corner for gap filling. For, if the weather is not favourable or there is an attack of white ants, etc., the germination of the crop will be affected and there will be gaps in the crop. Fill up these gaps as soon as you notice them, from the wheat nursery. Do this before the first week of December.

IRRIGATING THE FIELD

Give the first irrigation of two inches, three to four weeks after sowing, when the plants are about six inches high. In case the rains fail during December, give the second irrigation in the first fortnight of January.

Give the third irrigation of about three inches, in the first or second week of February when the crop is in the milk stage. Give the irrigation when there is no strong wind, preferably in the evening so that the crop may not lodge.

INTERCULTURING THE CROP

See that the crop is free of weeds, and is properly hoed after the first irrigation, when it is approaching the tillering stage.

Complete the hoeing and harrowing by the seventh week; for this is the period when the crop can utilize the manures and moisture most.

Broadcast 20 to 25 pounds of 10 per cent BHC to save the crop from *gujhia* pest.

Rogue out regularly the smutted or diseased plants.

HARVESTING THE CROP

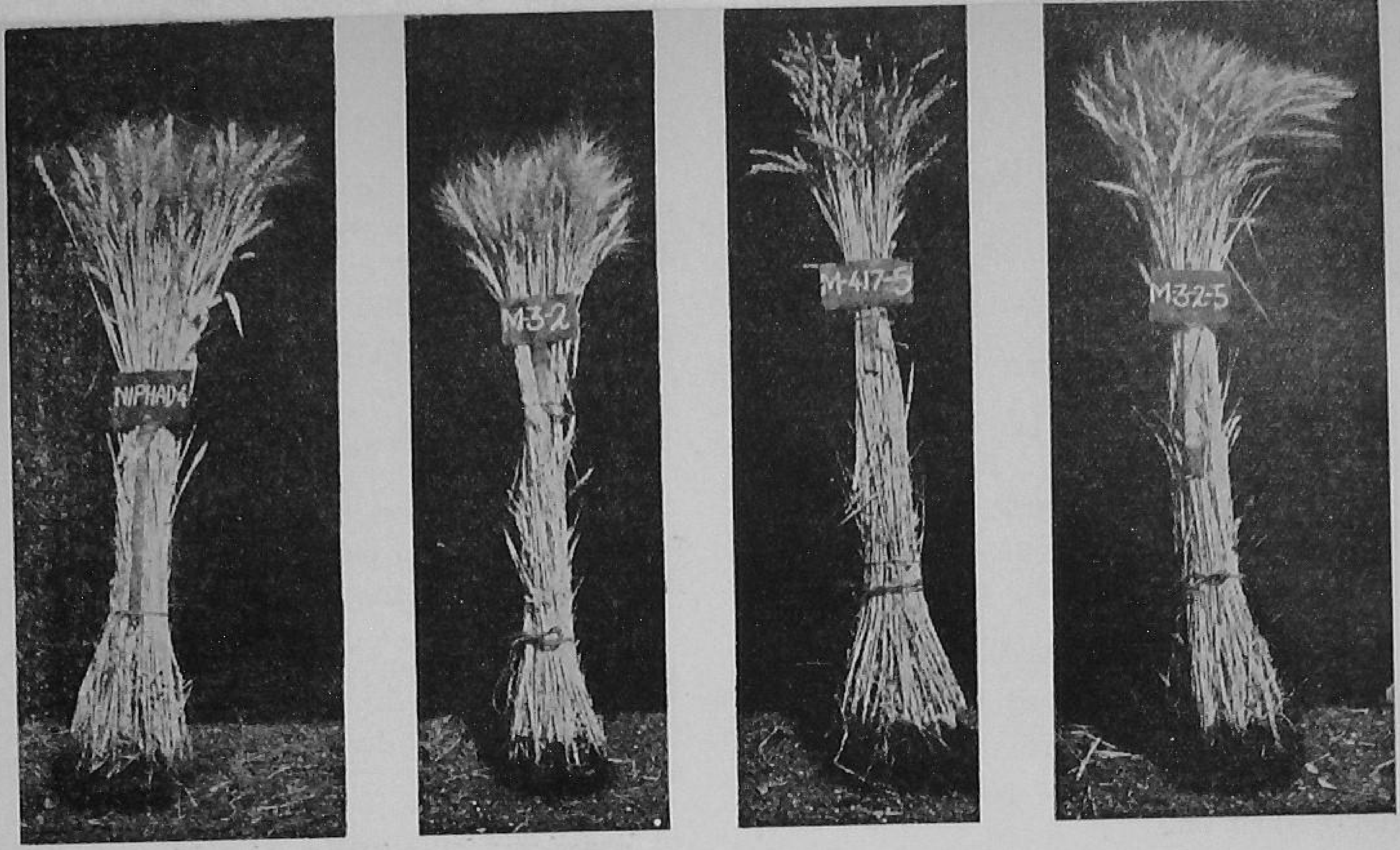
Harvest the crop when the wheat stalks are quite dry and easily break when bent. Use an Olpad thresher to thresh the harvested crop.

STORING THE PRODUCE

Dry the harvested crop completely in the sun and pack in clean and disinfected bags.

Store these bags on a thick layer of dry *bhoosa* so that moisture does not reach these bags and help in the growth of storage pests.

With these tips, popularly known as 'U.P. Method of Wheat Cultivation,' many farmers in Uttar Pradesh are getting as much as 4,000 pounds of grain an acre. You too can get this good yield if you care to put these useful tips into practice.



HOW MAHARASHTRA FARMERS CAN GET BIGGER WHEAT YIELDS

By M. B. GHATGE

Some improved wheats of Maharashtra

DO YOU KNOW ?

* That Maharashtra stands fifth in wheat acreage as well as in yield in the country, area under wheat being 2.3 million acres and the yield—3.67 lakh tons a year.

* That the production has gone up by 54 thousand tons at the end of the Second Plan Period over that of the First Plan.

* That within the State, Nagpur Division stands first in yield and in acreage; Aurangabad Division the is second.

* That during the Third Plan, another research station will be established at Washim in Akola District to carry out breeding work on wheat.

FORTY FOUR years ago, research on the improvement of the wheat crop in Maharashtra was started. Since then, constant efforts are being made to:

* produce varieties which yield better and give good results with fertilizers;
* evolve varieties resistant to diseases like rust, loose smut and foot rot;
* find out better cultural and manurial practices.

Only a tenth of the 2.3 million acres under wheat in the State, is irrigated. The remaining area depends on the rains. The rainfed crop is mostly grown on black cotton soil, having a good moisture-holding capacity (receiving 20 to 40 inches of rainfall). For an irrigated crop, a well-drained black loam or alluvial soil is preferred.

Farmers in the State can reap a better wheat crop, irrigated or unirrigated, if they take up the improvements based on research, as suggested by the State Department of Agriculture. The recommendations are given below.

GROW A BETTER VARIETY

A large number of high-yielding, disease-resistant varieties of improved wheats are available to farmers. Choose the one suited to your farm conditions.

PREPARE THE LAND WELL

Wheat is a winter crop. A good harvest will depend upon the amount of moisture conserved in the soil during the *kharif* season.

Immediately after the harvest of the previous crop, plough the land thoroughly to expose the soil to the heat of the sun. In case the land cannot be ploughed in summer, start the ploughings with the onset of the monsoon. The number and depth of ploughings will differ from district to district. But, generally, a single ploughing with an iron plough at six to seven inches depth will suffice.

During the *kharif*, work the soil frequently with a bladed harrow at two to three weeks' interval. In some districts, three to four ploughings with a wooden plough, followed by two to three horrowings are given. These frequent horrowings help the soil absorb more moisture, prevent surface run-off, provide good aeration to the soil and put down weeds. This practice enriches the soil also.

Work the horrow once again in September. This will create good a surface mulch and prevent drying up of the soil just before sowing.

In low rainfall areas, the land is not ploughed. It will be better if you scoop out the soil, to make small hollows, from different places in the field. These hollows will hold rain water. You can also bund your field to prevent surface run-off.

SOW IN TIME

Never miss the correct time of sowing. The second to the third week of October is the best time for sowing.

If you sow the crop too early, the newly-germinated seedlings will suffer badly in the intensive heat of October. Also, post-monsoon rains, if received, are not good for the seed sown. Similarly, if you sow late, the germination of the seed is affected, resulting in poor crop growth. The early hot spells during the ripening period are bad for the crop. Hence, always sow the seed at proper time.

SOW THE RIGHT WAY

For the rainfed as well as irrigated crop, sow the seed using a seed-rate of 40 pounds per acre. That is enough. For sowing, use a two or three-coultered heavy seed-drill, spacing the crop at 10 inches between the rows.

IRRIGATE PROPERLY

The number of irrigations you have to give to the crop will depend on the amount of moisture the soil is able to keep. You may require to give the crop three to four irrigations during its growing period. Give the first irrigation 25 to 30 days after sowing, and the following ones at 3 to 4 weeks interval. See that you do not irrigate your crop heavily. If you do, the crop will produce more straw than grain. Heavy irrigation also makes the crop easily get diseases like rusts and *Alternaria.*

FEED WHEAT HEAVILY

At the end of August or during the first week of September, spread well-decomposed manure evenly on the land and mix it well with the soil by harrowing. Five cartloads for a rainfed crop, and ten for an irrigated one will be sufficient. You can as well raise

Turning in the *sannhemp* crop in the field

sannhemp in kharif to green manure the wheat crop. Apply 100 pounds of phosphoric acid at the time of sowing the green manure crop.

In addition to organic matter, give fertilizers also. Apply 200 pounds of ammonium sulphate and 112 pounds of superphosphate to the irrigated crop.

A rainfed crop responds neither to groundnut cake nor to ammonium sulphate. But under assured rainfall conditions, you can give 100 pounds of ammonium sulphate and 120 pounds of superphosphate with good results. Drill the fertilizer at the time of sowing.

KEEP DOWN WEEDS

Give one or two hand-hoeings to keep down weeds and to conserve moisture.

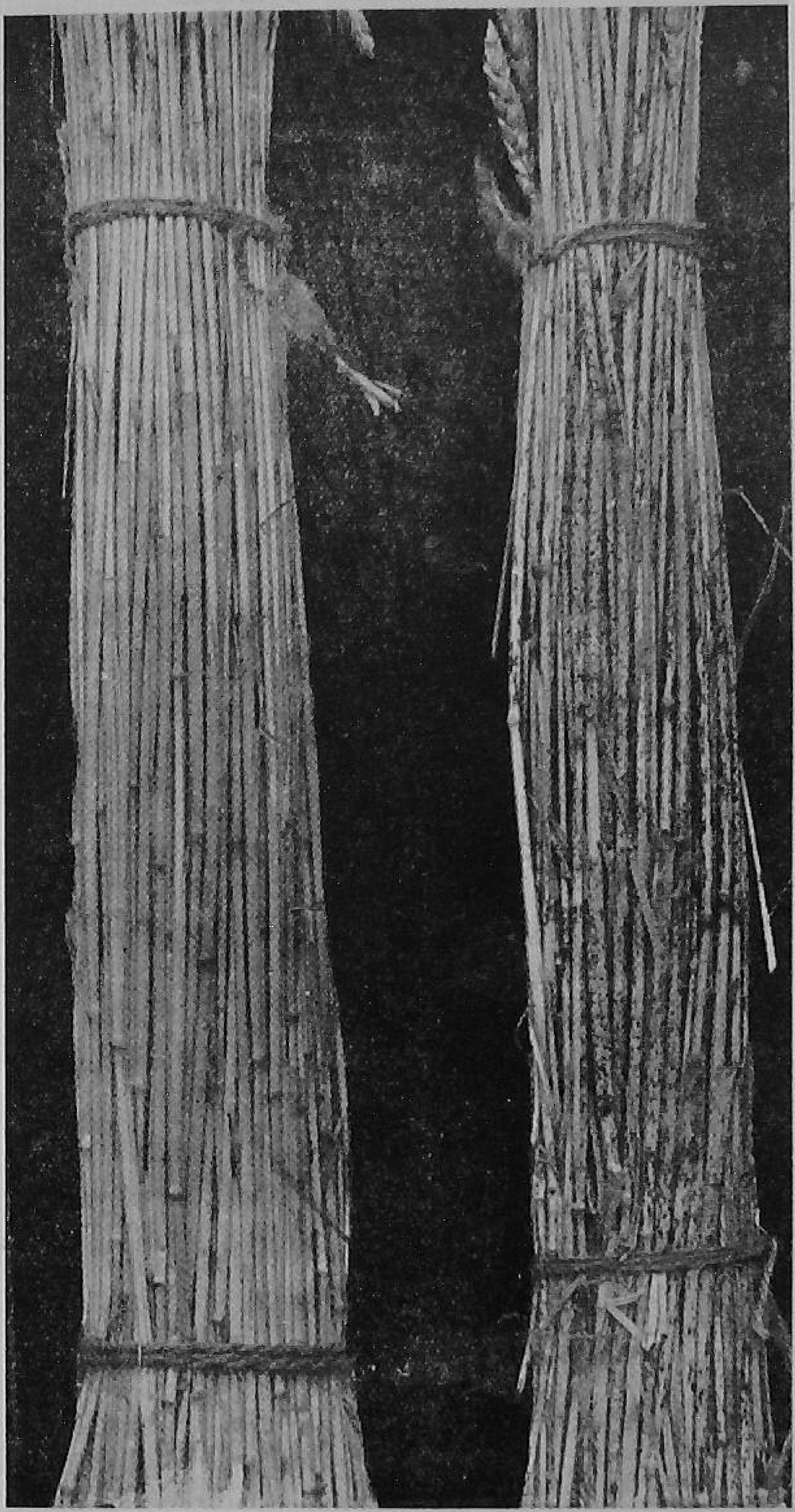
CONTROL PESTS AND DISEASES

Stem-borer: Control it by uprooting and burning the affected plants from the field.

Wheat rusts : Of the two rusts that attack wheat in Maharasthra, black rust is more dangerous. You can control it by dusting the crop with sulphur. The best thing, however, would be to grow rust-resistant varieties.

Root rot or crown rot: This disease attacks the crop just after germination. To control, treat the seed with a mercury compound like 'Agrosan GN' or TMTD at 1 ounce to 20 pounds of the seed.

Loose smut of wheat. To control, treat the seed by solar heat treatment. The treatment consists of soaking the seed in water for four hours in the morning on a clear day of May, removing the seed from water after that and exposing it to the sun in a thin layer till it dries thoroughly.



Rust-free stems Rust-infected stems

If you notice any affected plant in the field, uproot it and burn.

Follow these practices, and see if the harvest is not bigger and better.

	Strain	Suited to	Approximate duration in days	Average grain yield per acre on Farm. Kg./Lb.	Percentage increase over local	Special features
				T. DURUM		
1.	Motiya (Bansi-168)	Dhulia District for dry cultivation.	127	318/700	10.15	Better grain, pearly, lustrous.
2.	Gulab (Bansi-224)	Jalgaon for dry cultivation	135	340/750	20.00	Yields well on heavy soils slightly bolder and with oily lustre.
3.	Jay (Bansi-pally-808)	Deccan for dry cultivation.	120	240/525	11	Grain bold and of superior quality.
4.	Vijay (Niphad-81)	do.	122	272/600	12.15	Better grain quality, drought-resistant.
5.	PW-1	Kalamnuri in Parbhani Distt.	129	227/500	14	Grows well under drought conditions.
6.	PW-3	Marathwada where soils are heavy.	130	250 to 273 / 550 to 600	10	Yields well on heavy soils.
7.	PW-7	do.	138	227/500	17	Drought - resistant, suitable for dry cultivation, fetches high value in the market.
8.	N-59	Poona, Dhulia, Jalgaon, Nasik.	120	226/586	12 to 15	Highly stem - rust-resistant.
9.	N-125	do.	120	321/707	30 over N-81	do.
10.	N-271	Under trial.	124	341.36/751	25 over Vijay	do.
11.	N-974	do.	122	318.18/700	16 over Vijay	do.
12.	N-1200	do.	122	259.09/570	Equal to Vijay	do. do.
13.	NI-146	Poona, Nasik, Jalgaon.	128	514/1,134	Equal to N-4	do.
14.	NI-973	Under trial.	126	602.27/1,325	10 over N-4	do.

	Strain	*Suited to*	*Approximate duration in days*	*Average grain-yield per acre on Farm Kg./Lb.*	*Percentage increase over local*	*Special features*
15.	Baxi-288-18	Nasik, Ahmednagar Distts.	140	771/1,700	12	Best quality wheat, highly susceptible to rust.
				T. VULGARE		
1.	PW-5	Marathwada where soils are heavy.	133	340 (Dry)/750	22	Responds well to irrigation, susceptible to rust.
2.	Niphad-4	Western Maharashtra.	122	540/1,200	—	Better grain quality, rust - tolerant, good baking and milling quality.
3.	Kenphad-25	Deccan.	136	681/1,500	—	Highly stem - rust-resistant.
4.	N-177	Ahmednagar districts.	130	622 to 794 / 1,370 to 1,750	17	Highly rust - resistant, and tolerant to *alternaria*.
5.	N-345	Nasik, Kolhapur, Dhulia Jalgaon.	130	604 to 784 / 1,330 to 1,725	14	Better grain quality, rust - tolerant, good baking and milling quality.
6.	N-179	Irrigated tracts.	130	657/1,446	23 over N-4	do.
7.	HY-65	do.	130	272 (Dry)/600 907 (Irri.)/2,000	— 15	Resistant to stem-rust.
8.	NP-710	do.	—	204 (Dry)/450 680 (Irri)/ 1,500	—	Rust - tolerant, highly resistant to loose smut.
				UNDER DISTRICT TRIAL		
9.	NI-284-S	Under trial	135	636.3/1,400	17 over N-4	Highly resistant to stem-rust.
10.	NI-917	do.	127	681.8/1,500	25 over N-4	do.

WHEAT GAINS MORE GROUND IN WEST BENGAL

By N. MITRA

With just over 85,000 acres under wheat, yielding about 25,000 tons a year, West Bengal imports as much as 7 lakh tons of wheat each year to feed her population. But wheat cultivation getting more and more popular in the *rabi* cropping programme with irrigation water available from D. V. C. and Mor projects and especially in deep tubewell-irrigated areas.

WITH just about 85,000 acres under wheat, yielding about 25,000 tons a year, West Bengal imports as much as 7 lakh tons of wheat each year to feed her population. Wheat cultivation, however, is getting more and more popular in *rabi* cropping programme with irrigation water available from D.V.C. and Mor Projects and especially in deep tube-well irrigated areas.

In growing wheat, West Bengal farmers are being asked to follow these important tips.

LAND

Select a highland loamy soil, with good irrigation and drainage facilities.

MANURES AND FERTILIZERS

Give 75 maunds of farmyard manure or compost, 2 maunds of superphosphate and 30 seers of ammonium sulphate or 15 seers of urea per acre, as a basal dose.

For top-dressing, give either 30 seers of ammonium sulphate or 15 seers of urea per acre.

VARIETIES

Grow one of these important, rust-resistant varieties of wheat.

(i) *N.P. 710* —For Howrah, Hooghly, Nadia, Murshidabad and Burdwan (eastern part) Districts.

(ii) *N.P. 798* —For Birbhum, Bankura, Midnapore, Purulia, Malda, West Dinajpur, Cooch Behar, Burdwan (western part) and Darjeeling (plains only) Districts.

Better cultural practices will lead to better wheat harvests

(iii) *N.P. 781* —For the hill areas of Darjeeling District.
N.P. 809
Ridley

SOWING

Sow the seed during November, excepting in areas where wheat follows early *aman* paddy.

Use seed-drills for sowing, giving a spacing of 9 to 12 inches between rows. Keep the seed-rate at 25 to 30 seers an acre.

INTERCULTURING

Use a wheel-hoe for weeding after a month of sowing. Thin out the plants so as to have a spacing of two to three inches between every two plants in a row.

TOP-DRESSING

After 2 to $2\frac{1}{2}$ months of sowing, top-dress with fertilizers. Follow it up with mulching by a wheel hoe.

IRRIGATION

Irrigate the crop two to three times as and when necessary.

DISEASES AND PESTS

Treat the seed before sowing with 'Agrosan G.N.' to avoid stem rot and leaf spot diseases.

HARVESTING

Harvest the crop when it is well-matured.

By G. A. PATEL

Gujarat has a 'PILOT' WHEAT SCHEME

THE Gujarat Department of Agriculture is not content with the average of 400 to 600 pounds that farmers obtain from an acre of dry wheat, or the 1,000 to 1,200 pounds an acre, they get from the irrigated wheat.

All the wheat farmers of the State are, therefore, being advised to take to improved practices, which can raise yields many times more.

For this purpose, the Department is working a Pilot Scheme for irrigated wheat that has already helped many farmers raise high yields, some having recorded as much as 4,900 pounds of grain an acre.

Of Gujarat's cropped area of 244 lakh acres, only 13 lakh acres are under wheat. Sixty per cent of this is under dry and 40 per cent under irrigated wheats. The important local varieties of dry wheats are *dhola-katha* and *rata-katha* belonging to the *durum* group. The irrigated wheats belong to the *vulgare* group and are known locally as *Chandusi*, *Pisi*, *Sarbati* etc.

As a dry crop, wheat is generally raised after *kharif* fallow, whereas irrigated wheat is raised as a second crop after the harvest of the *kharif* crops. Here are the more important things farmers are asked to do under the Pilot Scheme.

RAISE A GREEN MANURE CROP

Raise a *kharif* legume or a green manure crop before taking up the wheat crop.

While sowing the green manure seed of sannhemp, apply 20 pounds of phosphoric acid and then there will be no need for any cattle manure for this crop.

Plough under the green manure crop after four to six weeks' growth.

Give two ploughings and two harrowings to the land. Apply five to ten cartloads of well-rotted farmyard manure.

USE IMPROVED SEED

Select your wheat seed from the following varieties. Consult your Agricultural Officer or the Gram Sevak in the selection.

N.P. 710, *N.P. 718*, *KCN-133* for irrigated areas.

Arnej-206 (Amber), *Arnej-624* (Red) for dry areas.

Select pure, plump and healthy, seeds. Treat them, before sowing with, 'Agrosan GN' or 'Ceresan' (2 to 3 ounces for 60 pounds of seed) against the diseases that are spread by the seed.

For dry wheats, sow 40 pounds of seed with a spacing of 12 to 15 inches in between the rows. And for irrigated wheats, use 60 to 80 pounds with a spacing of 9 to 12 inches. Do not sow cross-wise.

APPLY ENOUGH FERTILIZERS

In irrigated lands, give 40 pounds of nitrogen (in the form of ammonium sulphate) and 20 pounds of phosphoric acid (in the form of superphosphate) except when you are taking wheat after a green manure crop.

Apply phosphatic fertilizer before sowing, at the time of preparatory tillage. Apply ammonium sulphate in two equal doses—the first one at the time of sowing and the second three weeks later.

Place superphosphate near the root-zone of the crop with the help of a seed-drill. Do not broadcast the fertilizer.

In case you are growing wheat under dry conditions, give 10 to 20 pounds of nitrogen

per acre (in the form of ammonium sulphate) at the time of sowing; but make sure that there is enough moisture in the soil then.

IRRIGATE IN TIME

When and how much to irrigate depends on the type of soil and climatic conditions. Normally, you can give seven to ten irrigations at intervals of seven to ten days.

Do not flood the field. Prepare long, narrow or rectangular flat beds depending on the level of the soil to help you give even irrigations.

In the irrigated fields, intercultivate once or twice. Control the weeds by spraying 2,4-D, at 1½ to 2 pounds of the chemical. Spray it four to five weeks after sowing.

CONTROL PESTS AND DISEASES

Rusts are the major enemy of the irrigated crop. To avoid rust damage, grow rust-resistant varieties.

Among pests, rats and surface grasshoppers cause the major trouble. Rats generally attack the crop when it is ready for harvest.

To control rats, prepare poison baits with zinc phosphide mixed with flour. Mix 2½ *tolas* of zinc phosphide with a half-pound of wheat flour, and prepare small pellets from the mixture. Place these near rat burrows in the field. For first two days keep only ordinary flour pellets near the burrows. See which ones are eaten by rats. Place poison pellets in these places on the third day and, if necessary, on the fifth day also.

You can also control rats by fumigating the burrows with cyanogas dust (one ounce of dust per burrow) with the help of a fumigator pump. Close up all the treated burrows with moist earth.

To control surface grasshoppers, apply 5 or 10 per cent BHC dust at the rate of 15 to 30 pounds per acre. You can also use poison baits to control the hoppers.

HARVEST IN TIME

While harvesting the crop, see that it is not over-mature, as, otherwise, there will be a loss of grain due to shedding.

After harvesting the crop, thresh it with the help of an Olpad Thresher. This will save your time, labour and money as compared to trampling with bullocks.

FOLLOW A GOOD ROTATION

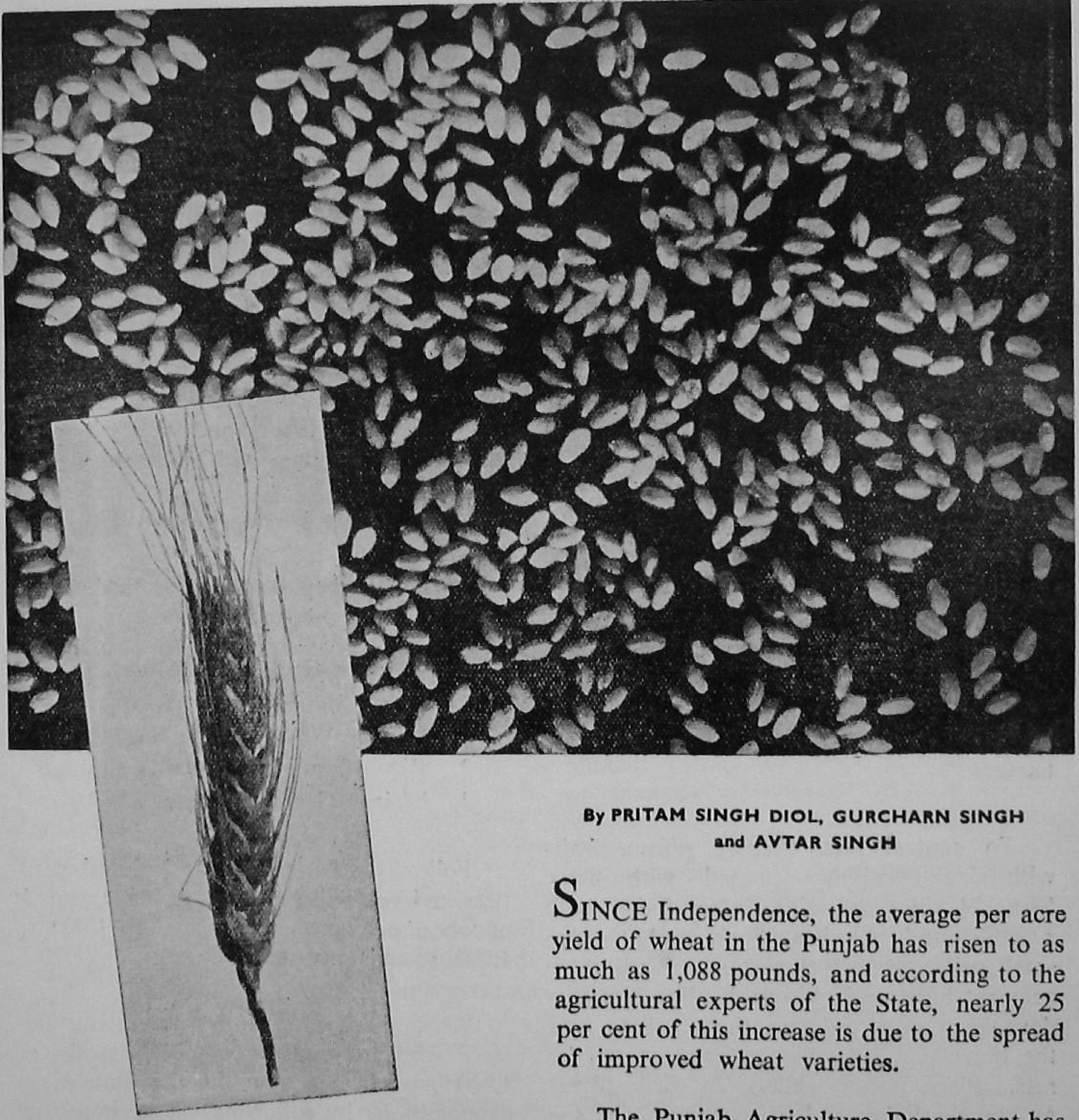
To get the best out of your field, follow any one of these crop rotations.

1. *Bajra* or Groundnut–Wheat
2. *Jowar* or Cotton—*Kharif* fallow—Wheat (dry)
3. Rice—Gram or Wheat
4. Maize—Gram or Wheat

Follow these improved agricultural practices and you will get 2,000 to 2,500 pounds of wheat per acre as compared to 1,000 to 1,200 pounds per acre.

Why, there are some progressive farmers who have even obtained yields of 4,900 pounds per acre in the State Crop Competitions by following these improved practices !

PUNJAB'S IMPROVED WHEATS — ONE REASON FOR HIGHER YIELDS



By PRITAM SINGH DIOL, GURCHARN SINGH and AVTAR SINGH

SINCE Independence, the average per acre yield of wheat in the Punjab has risen to as much as 1,088 pounds, and according to the agricultural experts of the State, nearly 25 per cent of this increase is due to the spread of improved wheat varieties.

The Punjab Agriculture Department has evolved a number of new wheats, and today,

every climatic region of the State has an improved wheat variety suitable for it. The work of breeding new wheats continues unabated, and newer wheat varieties, better than the existing ones in many respects are being released frequently.

Here are some improved wheat varieties, released in the Punjab after 1947 and some of the newer ones which are undergoing final yield trials.

THE NEW WHEATS

C. 281. A cross between *I.P. 4* and *C. 591*, it is a bearded type with felted glumes and is very early maturing. The grains are bold and flinty, possessing excellent baking quality.

It is susceptible to all the fungal diseases and is meant for cultivation in the south-eastern districts of the State under all conditions. It has, in fact, replaced *C. 591* and *C. 518* totally in these areas.

C. 273. A cross between *C. 209* and *C. 591*, it is a fully bearded variety with long and mid-dense ears which have white and felted chaff. It has bright, amber, hard and shapely grains.

It is resistant to lodging and is earlier in maturity than *C. 518* by a few days. It has excellent milling, baking and *chapati* making qualities and is moderately resistant to rusts and loose smut.

It is recommended for cultivation on average to rich lands of central districts under irrigated conditions and on rich lands of sub-montane districts of the Punjab. It has replaced *C. 591* and *C. 518* in the central districts.

C. 286. A multiple cross of *C. 250* and *C. 591* (*Pb. Type I* x *Khapli*), it is a fully bearded variety with white, smooth glumes, and possesses bold, flinty and amber-coloured grains. It is highly resistant to yellow rust and fairly resistant to black rust and loose smut. It matures earlier than *C. 250* by a few days.

It is recommended in place of *C. 250* for sowing under all conditions except on the rich lands of sub-montane districts, and for late sowing in place of *C. 228* in irrigated lands of central districts.

C 253. A cross of *Pb. 25* and *I.P. 165*, it is cultivated in the lower hills of Kangra, Hoshiarpur, Ambala, Patiala and Simla Districts.

It is a beardless type with white, smooth glumes, and its straw is strong and resists lodging considerably.

It is resistant to yellow rust and loose smut attack, but is highly susceptible to black rust. Its grains are amber and semi-flinty. It is early in maturity and easy to thresh.

It is now recommended for general sowings in the high hills of Kulu Valley and also in place of *C. 224* which has become highly susceptible to bunt and other fungal diseases.

C. 285. A cross of *C. 228* and *B. 256* (Kenya wheat), it is cultivated in the Lahaul and Spiti Valleys of Kangra District, where wheat is grown during summer at an altitude of 10,000 to 11,000 feet.

It is a bearded variety and possesses mid-long, lax and smooth white ears. It is earlier than *C. 591* in maturity and possesses bold, amber grains of good quality.

It possesses heavy tillering capacity and weak straw. In the early stages of its growth, it presents a 'grassy' appearance. Its remarkable resistance to various strains of yellow

and black rust makes it specially suitable for high altitude conditions where black rust is a great trouble.

THE FUTURE WHEATS

The following wheats are now in the comparative yield tests for final selection to replace the existing types in the coming years.

C. 203. A derivative of the cross *Cul. 5 x C. 273*. It is a fully bearded strain and possesses attractive, fairly long and lax ear-heads. It is a tall-growing wheat and possesses hairy glumes.

It is strong stemmed and hence, does not lodge. Due to its good performance in the past, it is expected to replace *C. 273* under conditions of high fertility.

Many new wheats, high in yield and resistant to diseases, are being evolved in the Punjab.

C. 303:—A derivative of the cross *C. 286* and *C. 273*, it combines well the rust and loose smut-resistance of *C. 286* with the strength of straw of *C. 273*.

It is fully bearded, and possesses white and hairy glumes. It possesses a good tillering capacity and has done well under normal sown, late-sown and *barani* (rainfed) conditions of sowings.

C. 305:—A derivative of the cross *C. 286* and *C. 518*, it possesses almost the same good characters as *C. 303*, with the only difference that its head is not as lax but is medium dense instead. It is meant for normal sowing and has been found to be next to *C. 306* in yield performance during 1960-61.

C. 306 :—It is developed from a multiple cross of (*CW. 1974* x *Chz. No. 3*) x *C. 591* x (*P. 19* x *C. 228*).

It is a bearded wheat with white chaff and hairy glumes. It has a high tillering capacity and resists lodging considerably.

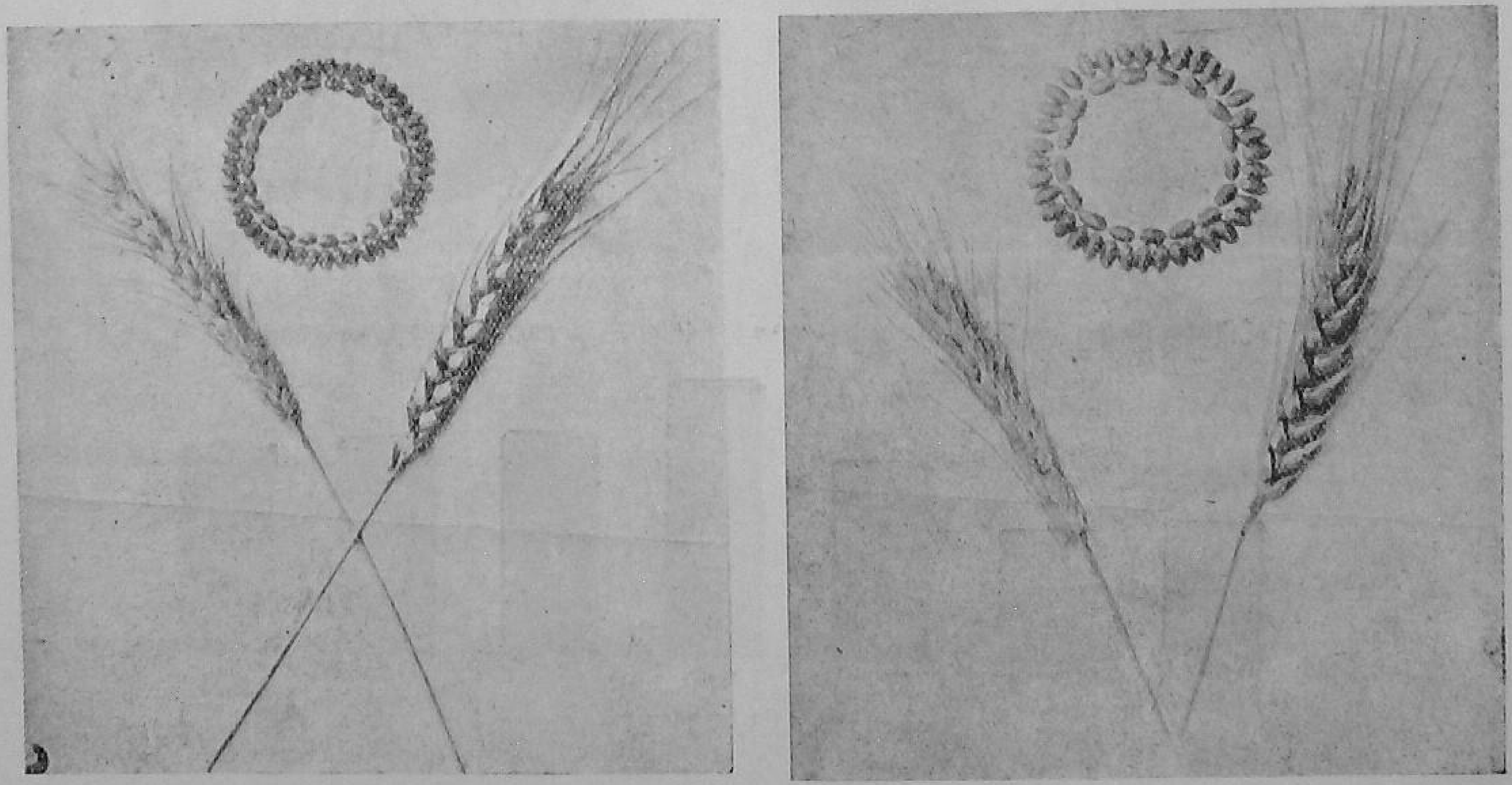
Grains are bold, amber and free from mottling. It possesses a high resistance to rusts especially to yellow rust. It is a universal wheat and is meant for general sowing in rich lands and under normal-sown, late-sown and rainfed conditions.

C. 307:—It is a derivative of the cross *C. 250* x *Trigo Centeria*. It is a bearded type with smooth white glumes. The earheads are long, lax and oblong in shape.

The grains are very attractive, bold (almost double the size of *C. 518*) and deep glossy amber in colour.

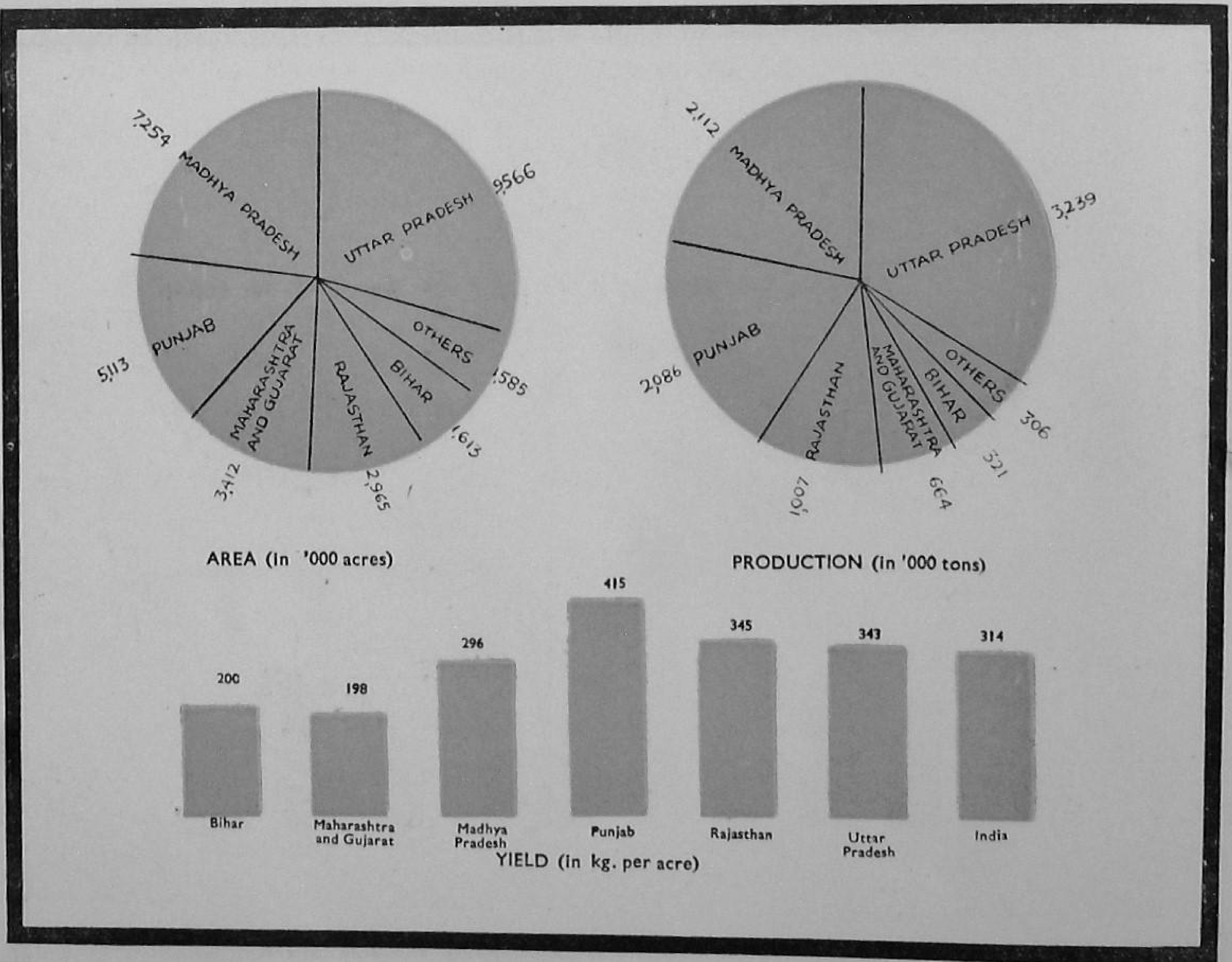
Being strong-stemmed, it resists lodging. It is completely resistant to all the rusts but is moderately resistant to loose smut.

It has done better than *C. 286*, both under irrigated and rainfed conditions, during the past few years. It is a definite improvement over *C. 286*.



Two improved wheats of the Punjab—*C. 273* (left) and *C. 286* (right)

WHEAT IN INDIA (1959-60)

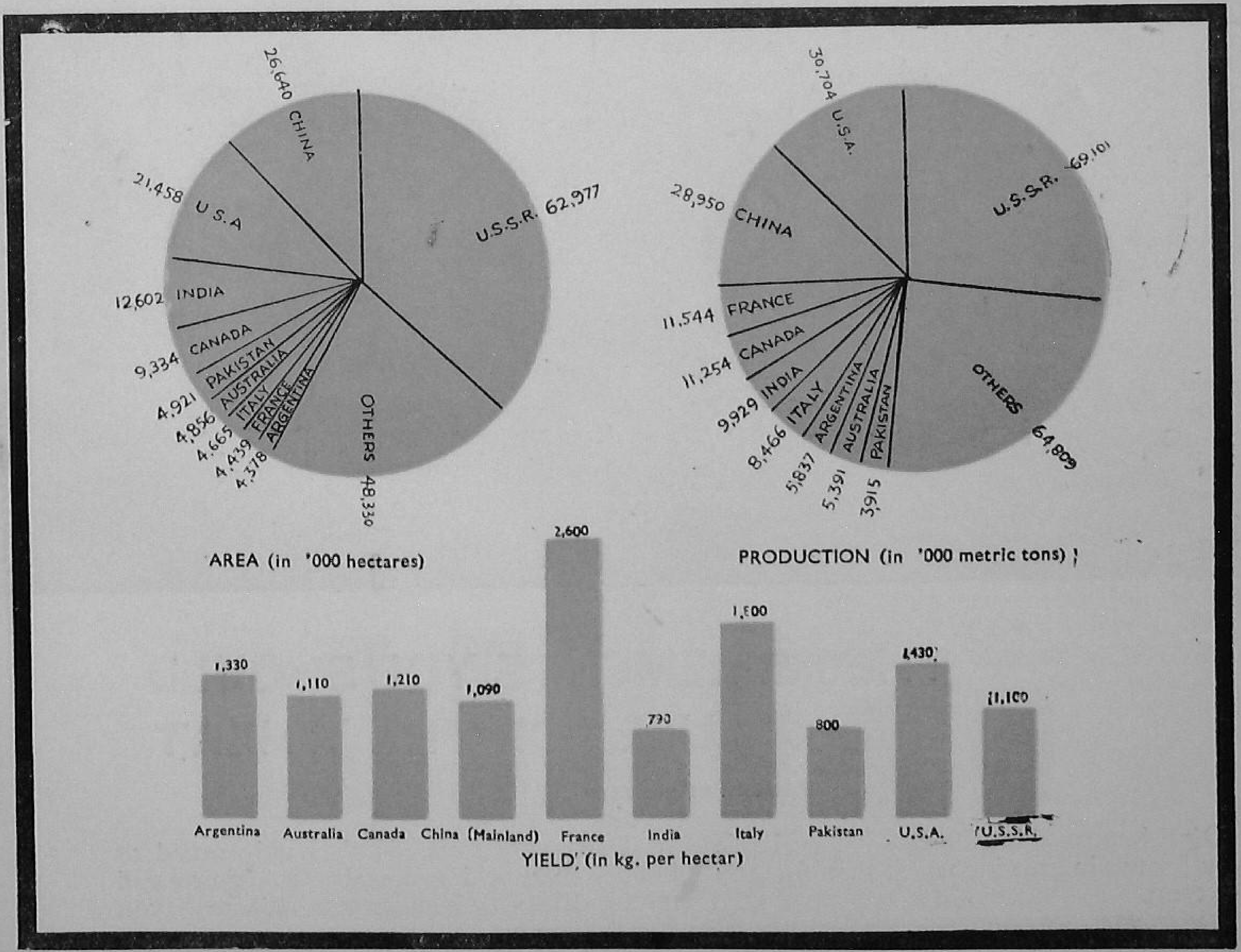


Wheat in India and abroad

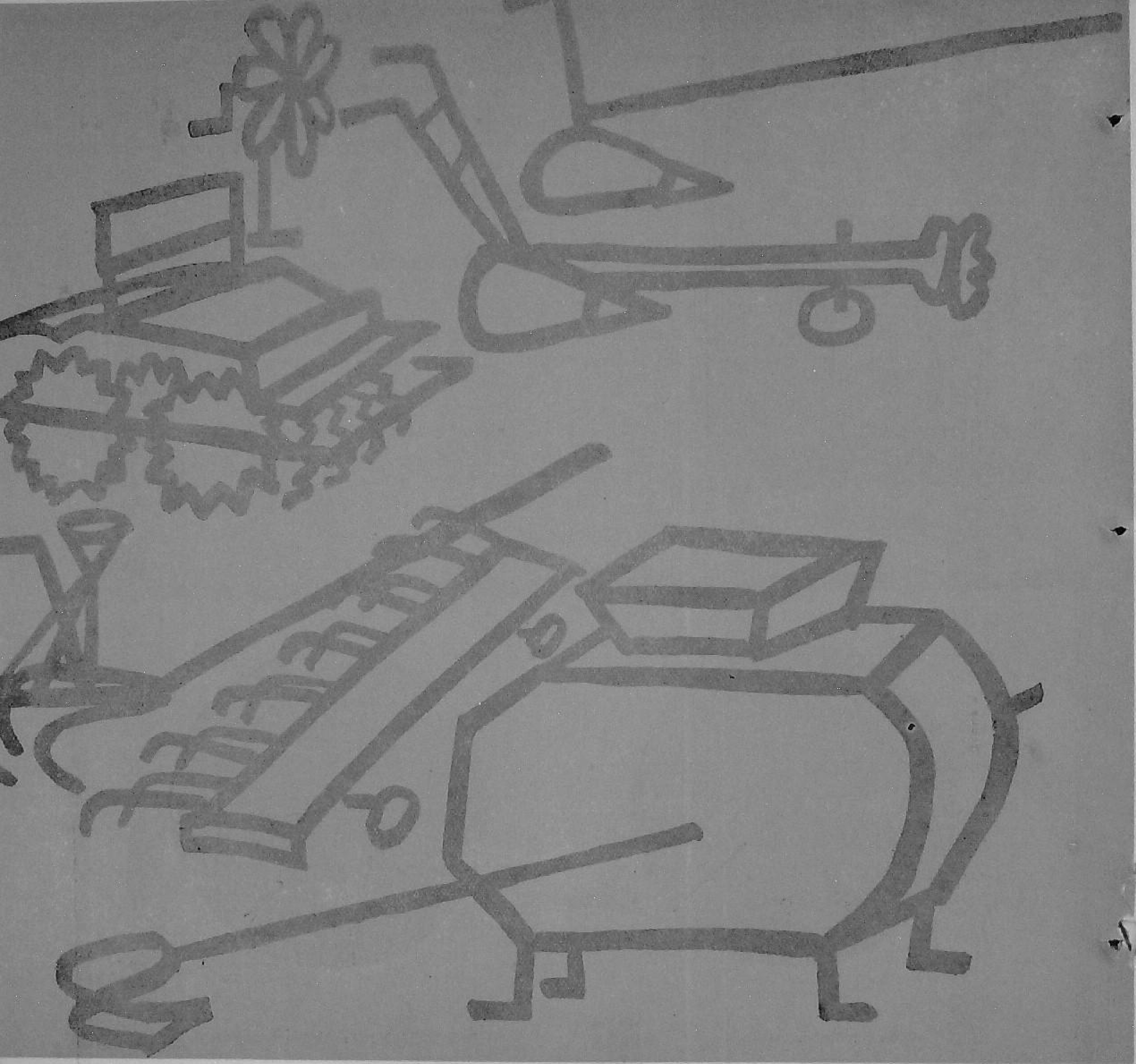
By S. RAMASWAMI

WHEAT one of the earliest crops under cultivation, now contributes about 13 per cent of the total food-grain production in India and 16 per cent of her total cereal production. The production increased by 21 per cent between the First Plan and Second Plan periods, which is the highest increase recorded for any foodgrain during this period. The area during the same period increased by 19.4 per cent, thus making for a 1.6 per cent increase in yield.

WHEAT IN THE WORLD (1959-60)



Figures for China (Mainland) are for the year 1958-59



THE IMPLEMENTS YOU SHOULD USE FOR THE WHEAT

By D. N. KHERDEKAR

MORE improved implements are available to you for use in growing wheat than for any other crop.

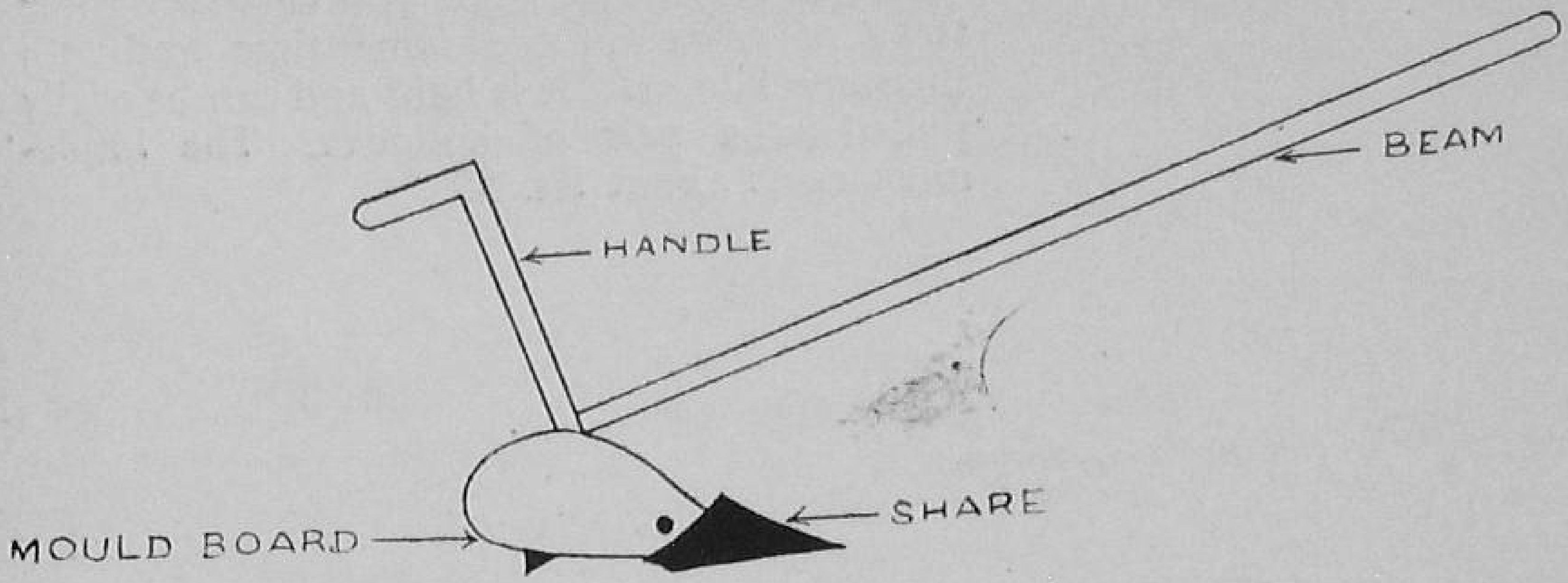
These vary from simple hand-worked or bullock-drawn implements to power and tractor-driven implements. Where you

have large fields or where co-operative farming is followed, you can use power machinery as they do in the western districts of Uttar Pradesh and the Punjab. Here a large number of wheat farmers own tractors and tractor-drawn machinery as well as power-driven centrifugal pumps for irrigation purposes.

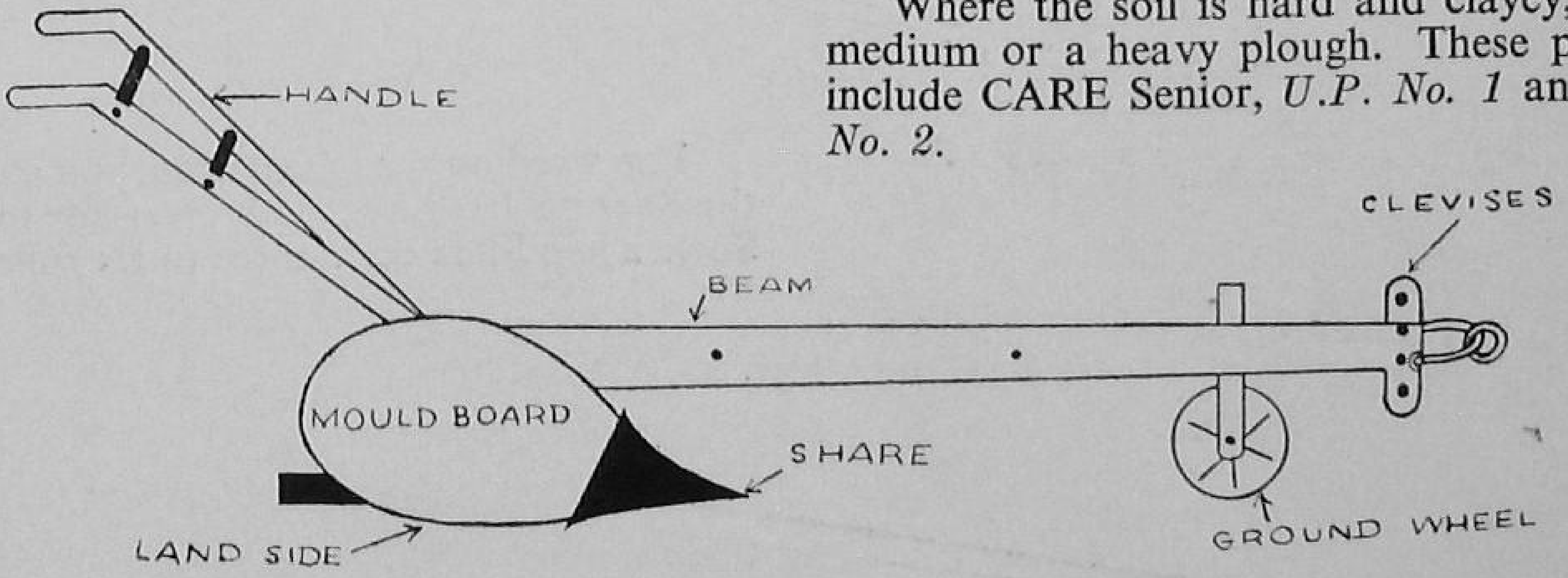
Among the simple types of implements which do not need power to work them include ploughs, levellers, seed-drills, threshers and winnowers. Most of the machinery and the implements are now being made in India, and you can get them quite cheap.

The simple manually-operated or bullock-drawn implements are useful to wheat farmers who own less than ten acres of land.

For opening up the land, light ploughs such as Meston, CARE Junior, and *Shabash* are already popular, and you will find them useful too.

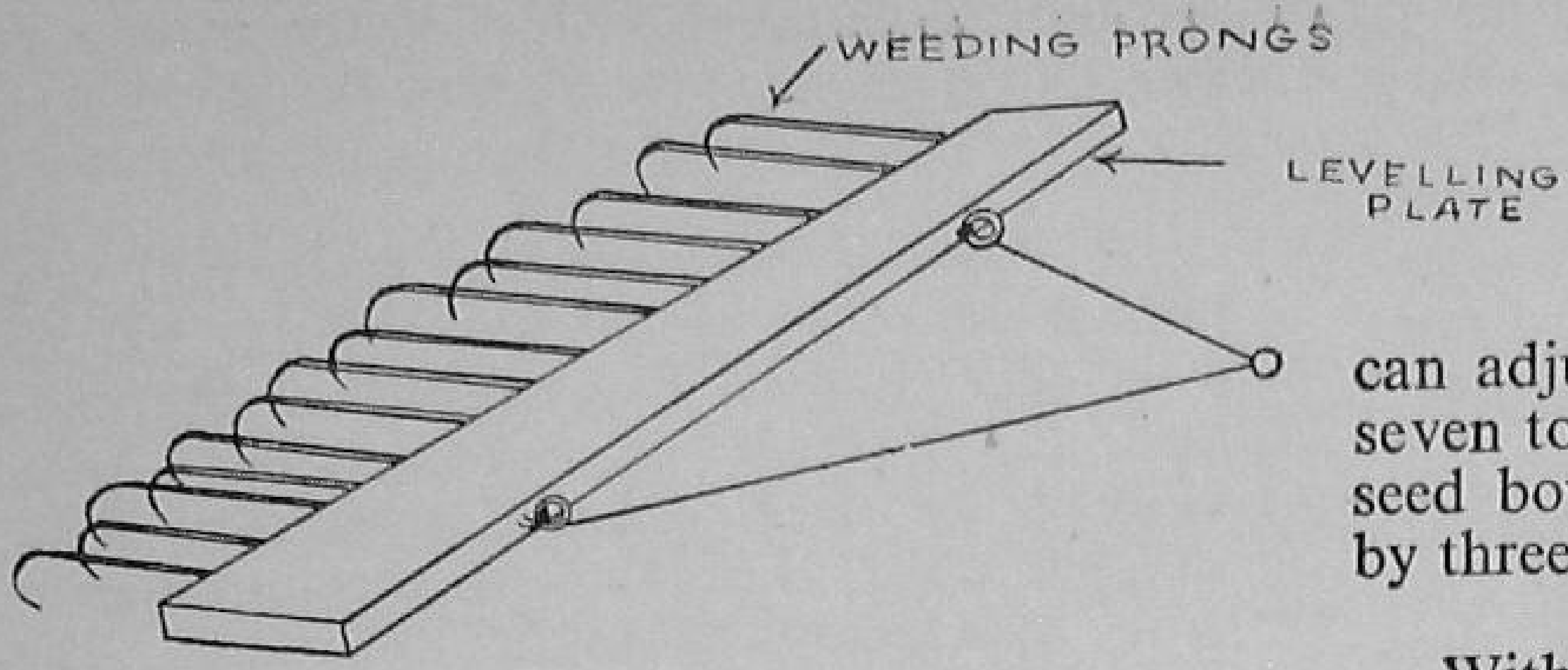


Where the soil is hard and clayey, use a medium or a heavy plough. These ploughs include CARE Senior, *U.P. No. 1* and *U.P. No. 2*.



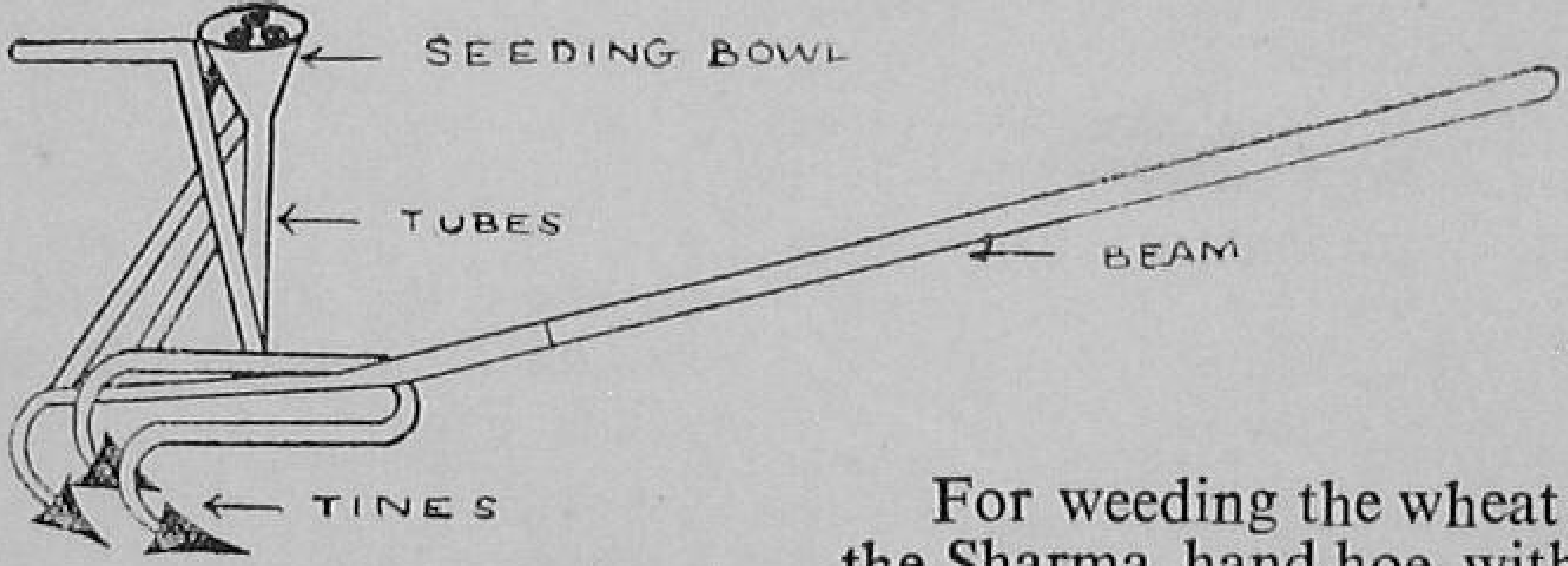
After the land is ploughed, and you want to break and pulverize the clods, you should use a very good implement called *Singh Patela*. This is available in sizes ranging from to 3 to 8 feet, and costing Rs. 30 to 60 according to the size. The *Patela* can be easily pulled by a pair of ordinary bullocks. It not only crushes the clods and levels the land, but also collects the weeds and trash for you to remove or destroy.

After the land is ready, you should use a *triphali* or a three-tined cultivator having a seeding attachment for sowing seed. You

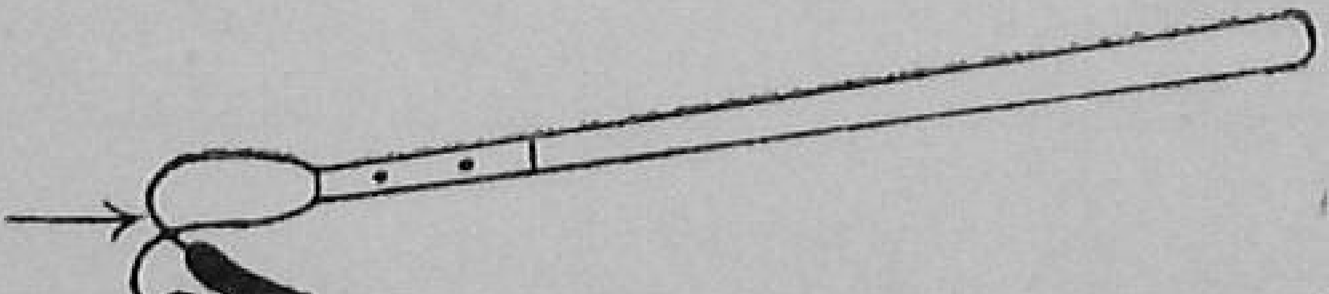


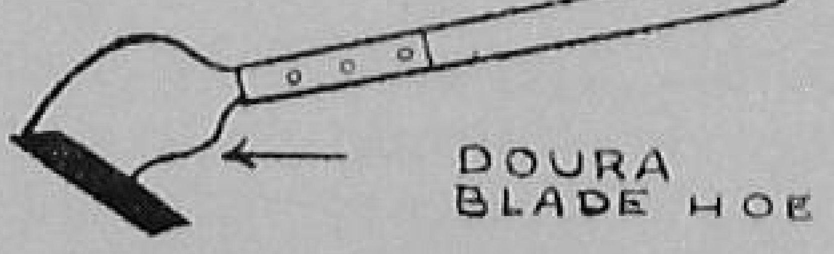
can adjust the distance between tines from seven to nine inches. Put the seed in the seed bowl which has three holes, connected by three tubes to the tines.

With this implement, you can sow three rows of wheat at the same time and with the same labour. It is light and can be easily pulled by a pair of bullocks. The implement costs about Rs. 55.

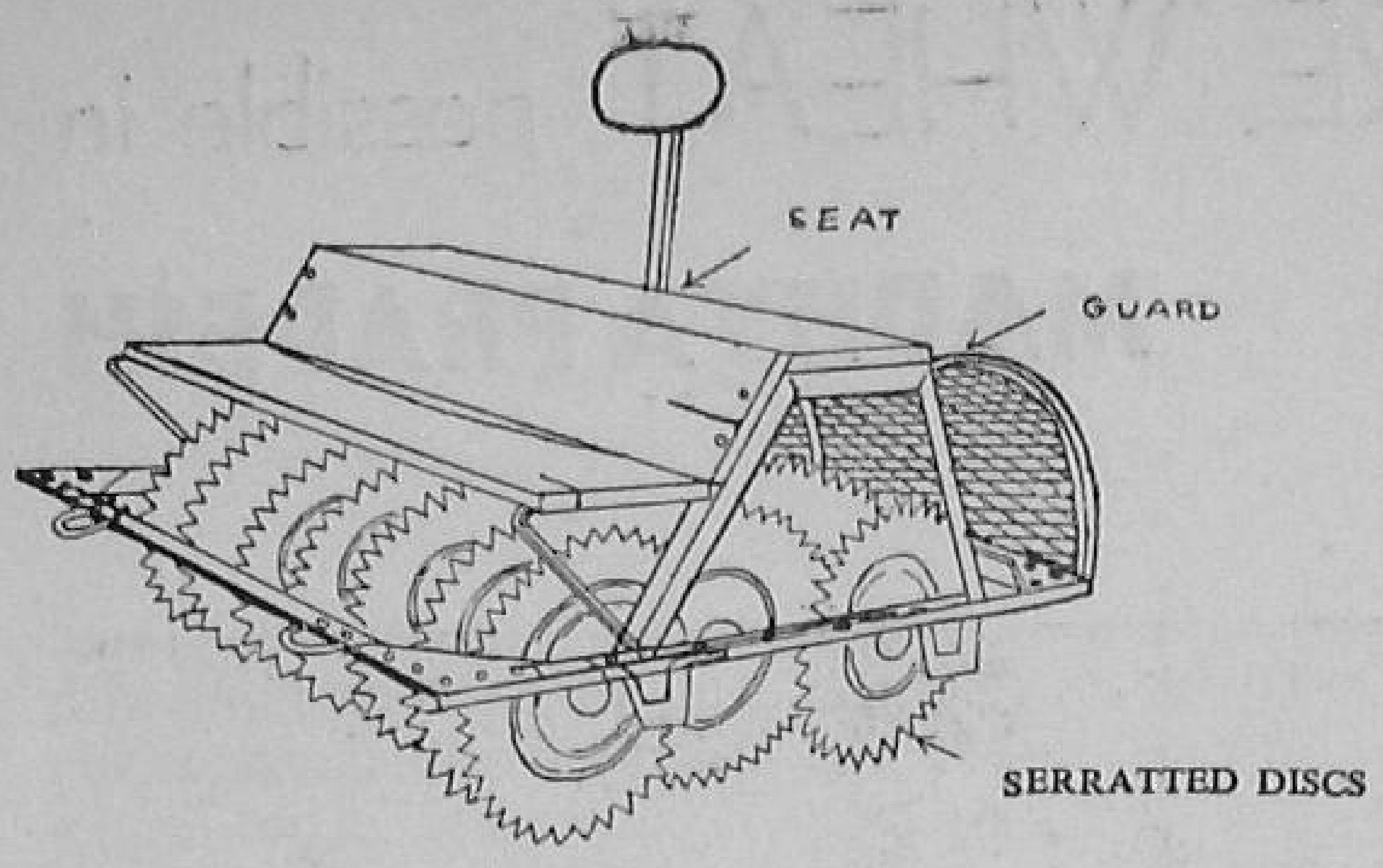


For weeding the wheat crop, you can use the Sharma hand-hoe with great advantage. Such a hand-hoe costs three to six rupees.



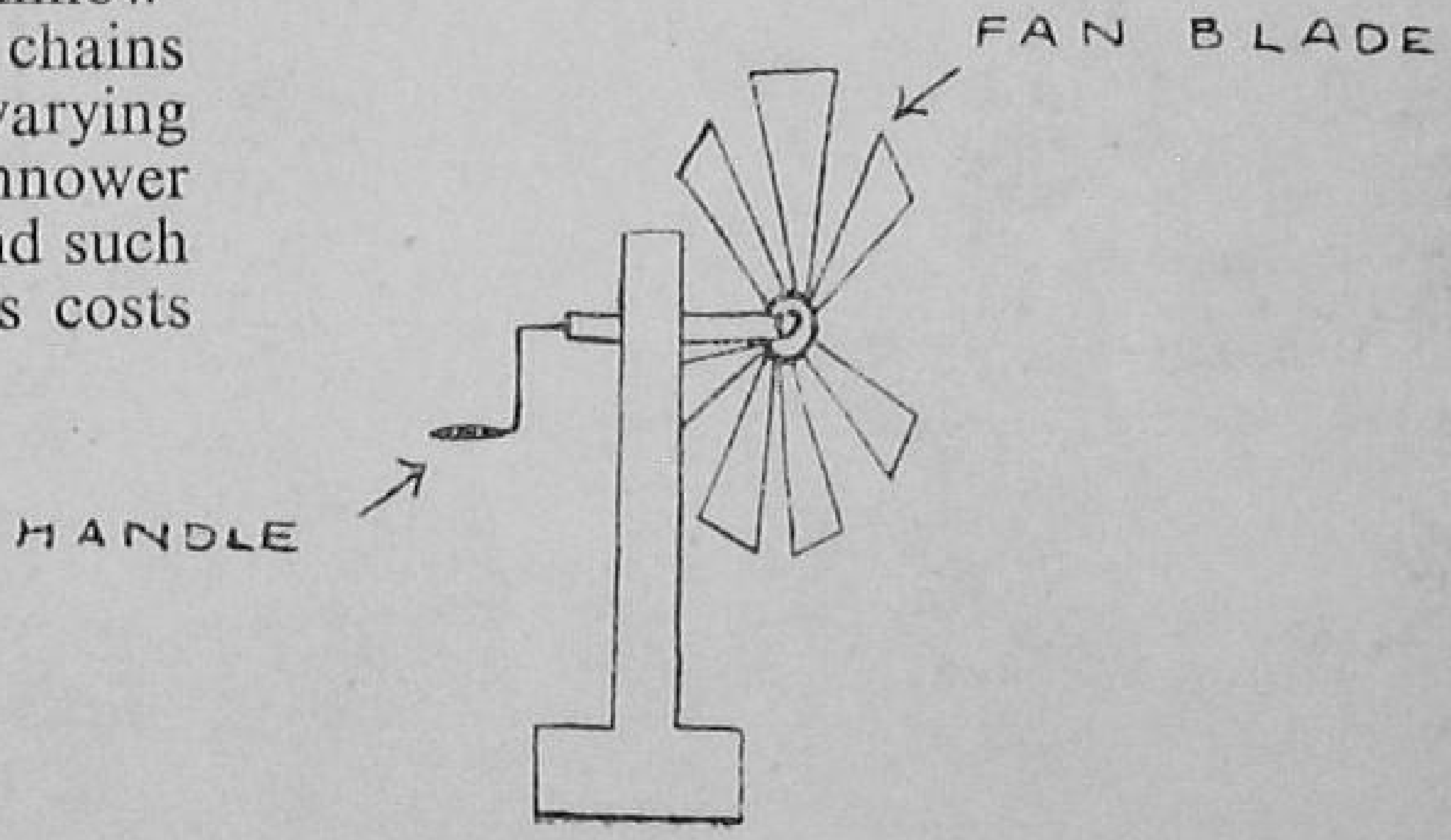


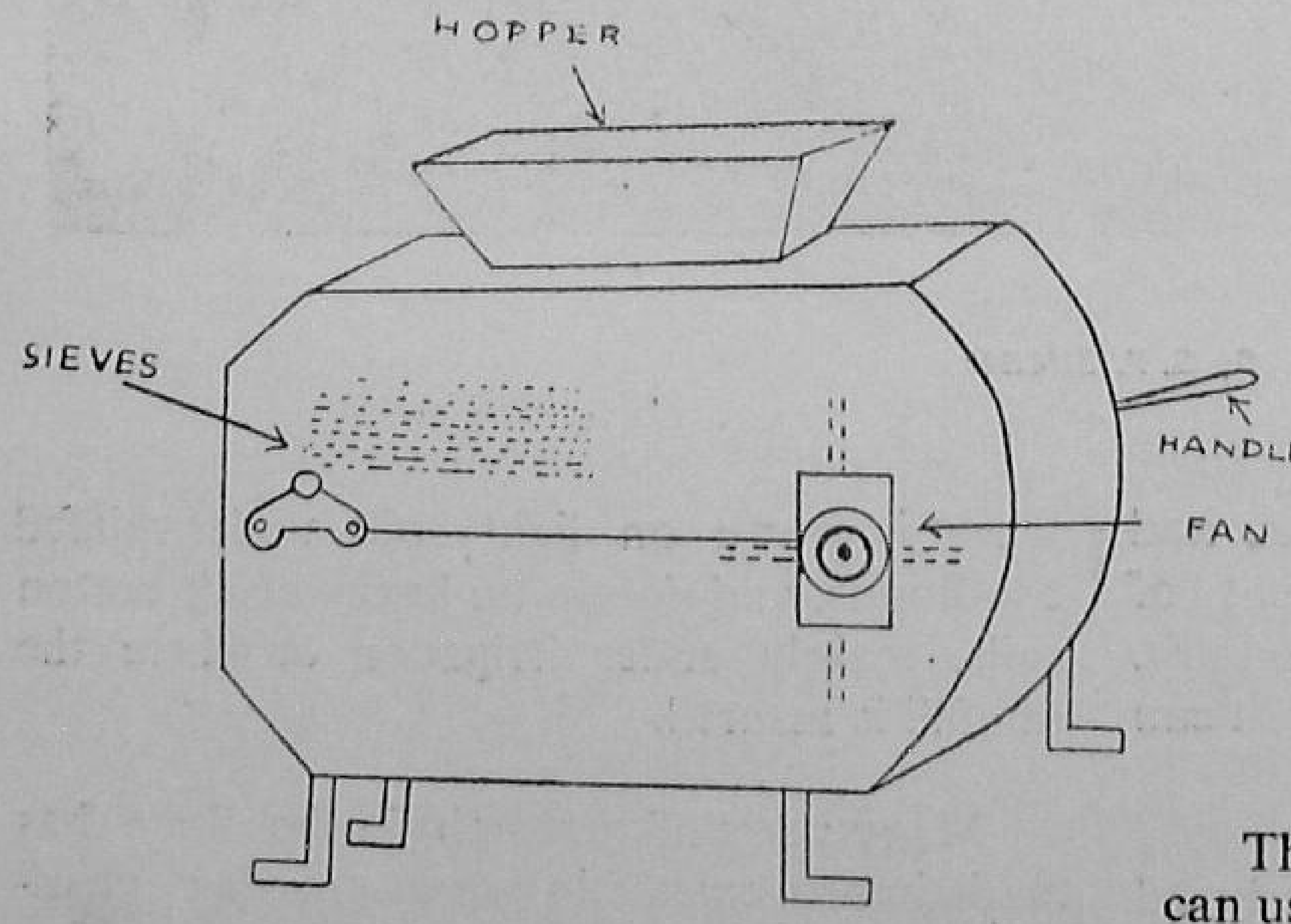
For threshing your crop, you can use the Olpad thresher, which has 11 to 21 serratted and sharp discs. These discs are mounted on 2 or 3 axles on a frame. A guard and a seat is provided for the driver to sit on.



A pair of bullocks can easily pull this implement. The thresher costs Rs. 300 to 400. The Punjab Department of Agricultural Engineering has also designed a portable power-driven wheat thresher. You can work this thresher with the power provided by a tractor having 25 to 30 H.P. The thresher costs Rs. 3,000.

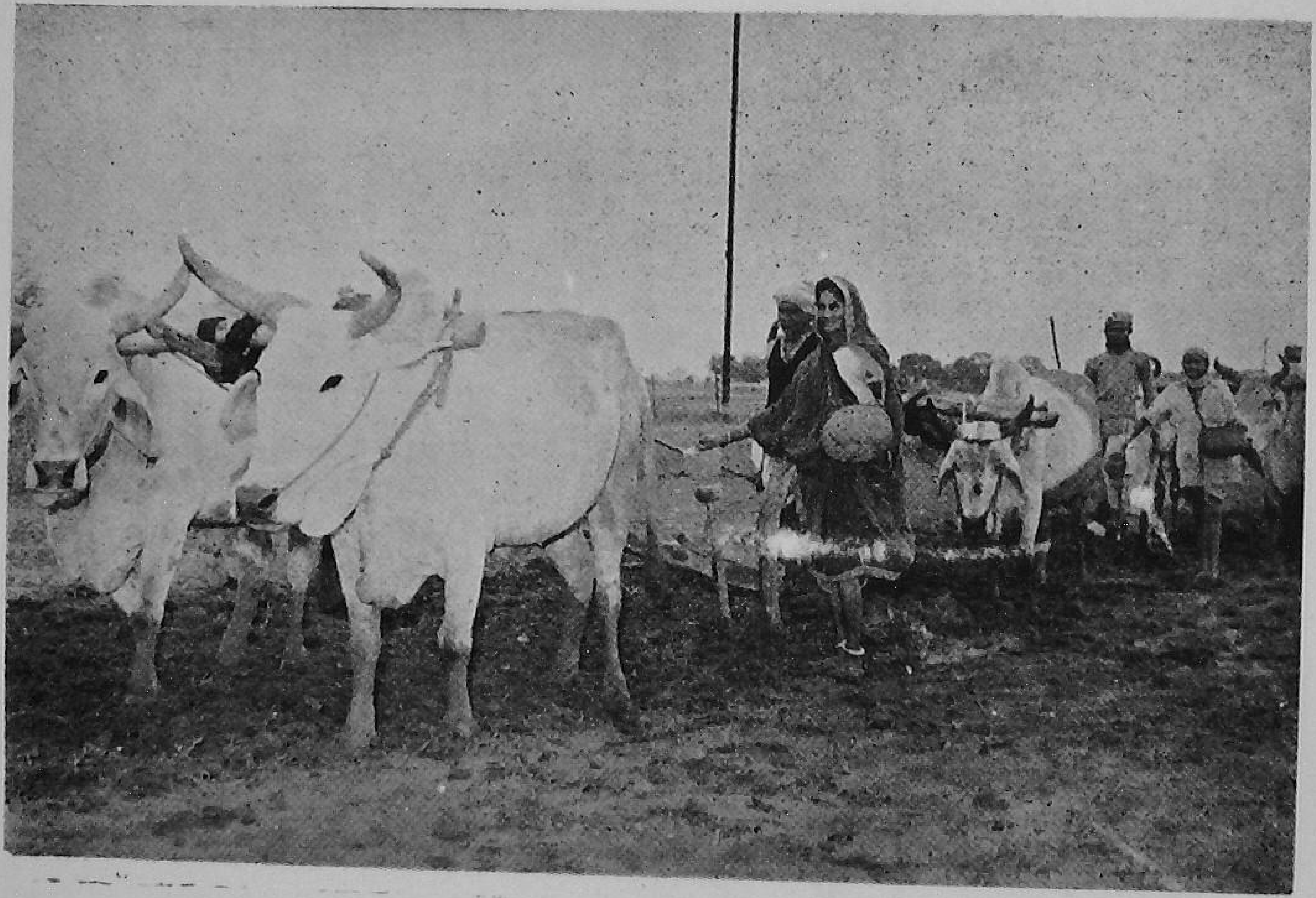
For winnowing the grains, several winnowing fans worked by rope, leather belts, chains or gears are available at a cost varying from Rs. 60 to 225. An enclosed winnower is now being manufactured in India, and such a winnower made of galvanized sheets costs Rs. 550.





Thus, from ploughing to winnowing, you can use with benefit at least a dozen improved implements, simple in design and cheap in cost. Use them and save on labour and time, and get more yields from your crop.

MORE WHEAT possible in MADHYA PRADESH



By S. P. SINGH

WITH 7.8 million acres under wheat, and producing today about 22 per cent of the total wheat produced in the country, Madhya Pradesh is trying to see how it can step up the per-acre yields.

In the State, *T. sativum* (common bread wheat) and *T. durum* (Macaroni wheat) are the two main types of wheat grown, the former occupying a larger area. The bread wheat is grown on light soils under rainfed conditions, and *durum* on heavy black cotton soils, mainly under irrigation or where the rainfall is assured.

Many years of research in the State has made improvements in wheat-growing possible. Farmers are being educated in these improved practices so that they can reap higher yields. These are briefly described here.

LAND PREPARATION

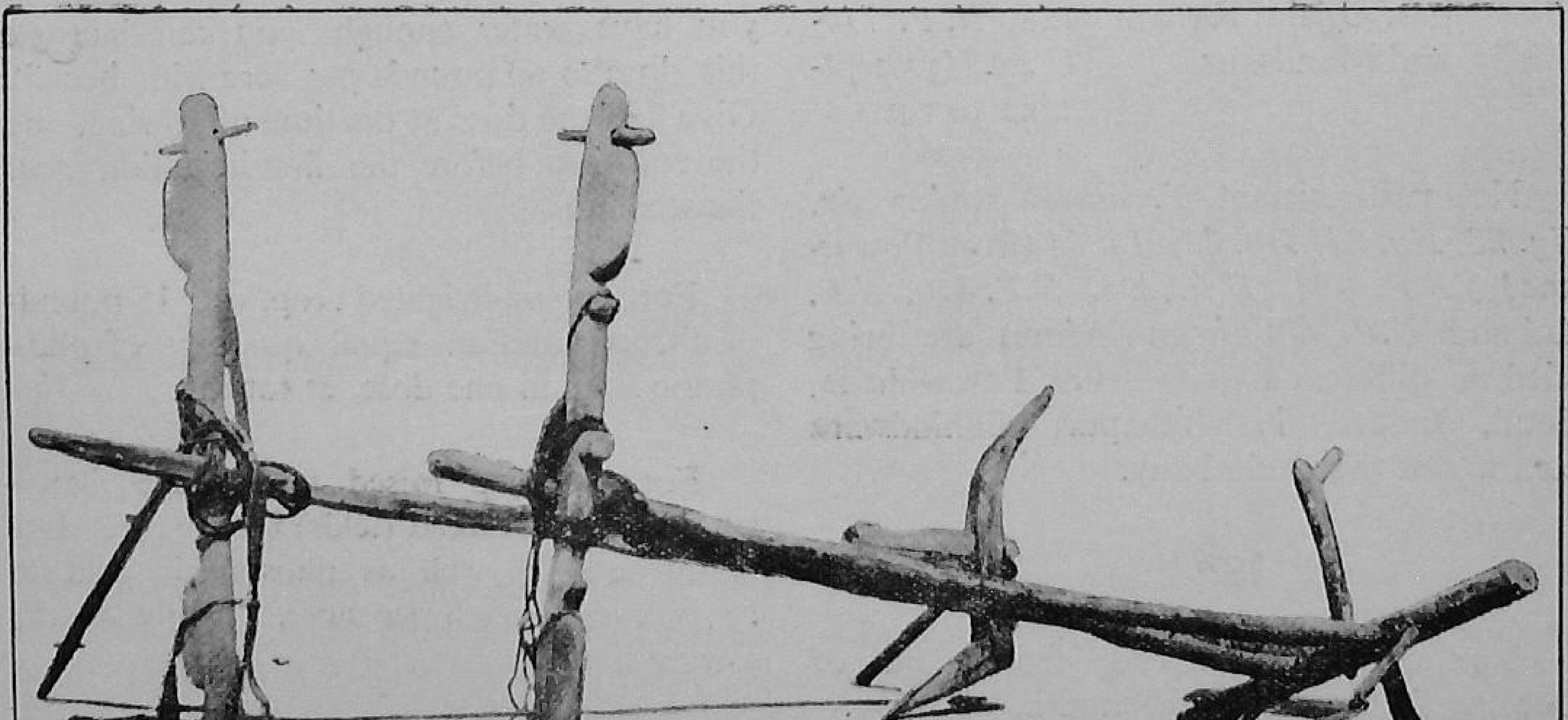
Wheat needs a fine seed-bed. You can prepare it by working the *bakhar* or *desi* plough four to six times. Better, give a heavy ploughing just before the monsoon followed by three to four *bakharings*. For a dry crop, take steps to conserve moisture during the rainy season, in addition. In the embanked fields, (the *haveli* system) you can collect rain water in the bunded field, and let it off about 15 days before the sowing time.

SEED SELECTION

Always sow a better variety. A large number of varieties suitable for the different regions and conditions in the State are available.

	Region	*Variety suitable*
(i)	All over the State	*Hy. 11*, *Hy. 65*
(ii)	For dry area	
	1. Northern districts	
	(a) Rewa, Satna, Chhatarpur, Tikamgarh and Datia	*Hy. 11*, *Hy. 38*, *Hy. 65*, *Hy. 277*, *C. 591* (susceptible to rust).
	(b) Gwalior, Shivpuri, Morena, Guna	*Hy. 11*, *Hy. 65*, *C. 281* and *N.P. 710*.
	2. *Central Madhya Pradesh*	
	(a) Bhilsa, Raisen, Sehore and Hoshangabad	*Hy. 11*, *Hy. 12*, *Hy. 25*, *Hy. 38*, *Hy. 65*, and *C. 591* (susceptible to rust)

A *desi* plough or a *bakhar* may be used for the land preparation



(b) Embanked areas of Narsimhapur, Jabalpur, Mandla and Damoh	*Hy. 11*, *Hy. 25*, *Hy. 38*, *Hy. 65*, *Hy. 277* and *C. 591* (susceptible to rust)
(c) Unembanked areas of the above Districts and Sagar District	*Hy. 11*, *Hy. 12*, *Hy. 38* and *Hy. 65*
(d) Betul, Chhindwara and Seoni	*Hy. 11*, *Hy. 12*, *Hy. 65* and *Hy. 277*

3. *Paddy tracts*

Balaghat, Raipur, Durg, Bilaspur, Surguja and Raigarh	*Hy. 65*

4. *Malwa Tract*

Nimar, Dewas, Indore, Dhar, Shajapur, Ujjain, Ratlam and Mandsaur	*Hy. 11*, *Hy. 38*, *Hy. 65*, *N.P. 718*, *N.P. 710-U 22*. (susceptable to rust)

New rust-resistant *T. durum* strains viz. *Hy. 23*, *Hy. 24*, *Hy. 32*, *Hy. 34* (from Powarkheda) *N.P. 404*, *N.P. 405*, *N.P. 410*, *N.P. 411* and *N.P. 412* (from Indore) are being tried on different state-farms at Powarkheda, Betul, Indore, Narsimhapur, Chhindwara etc., to test their suitability.

SOWING

You can sow the crop from 10th of October till the end of the month. However, it is better to sow early as soon as the moisture content and the temperature are favourable. Do not forget to treat the seed with 'Agrosan GN' at the rate of 20 ounces per maund before sowing.

Use a seed-rate of 80 pounds per acre. You will need a smaller quantity, if you are drilling the seed. Sow the seed 1½ to 2 inches deep in the bunded fields and 2½ to 3 inches in open fields, adopting a spacing of 9 inches for an irrigated crop and 12 inches in between the rows for a rainfed crop.

If possible, sow only one variety in a particular field if you want to keep the seed pure. If at all you have to grow more than one variety, grow gram or *teora* on a strip of 20 feet between the different varieties.

MANURING

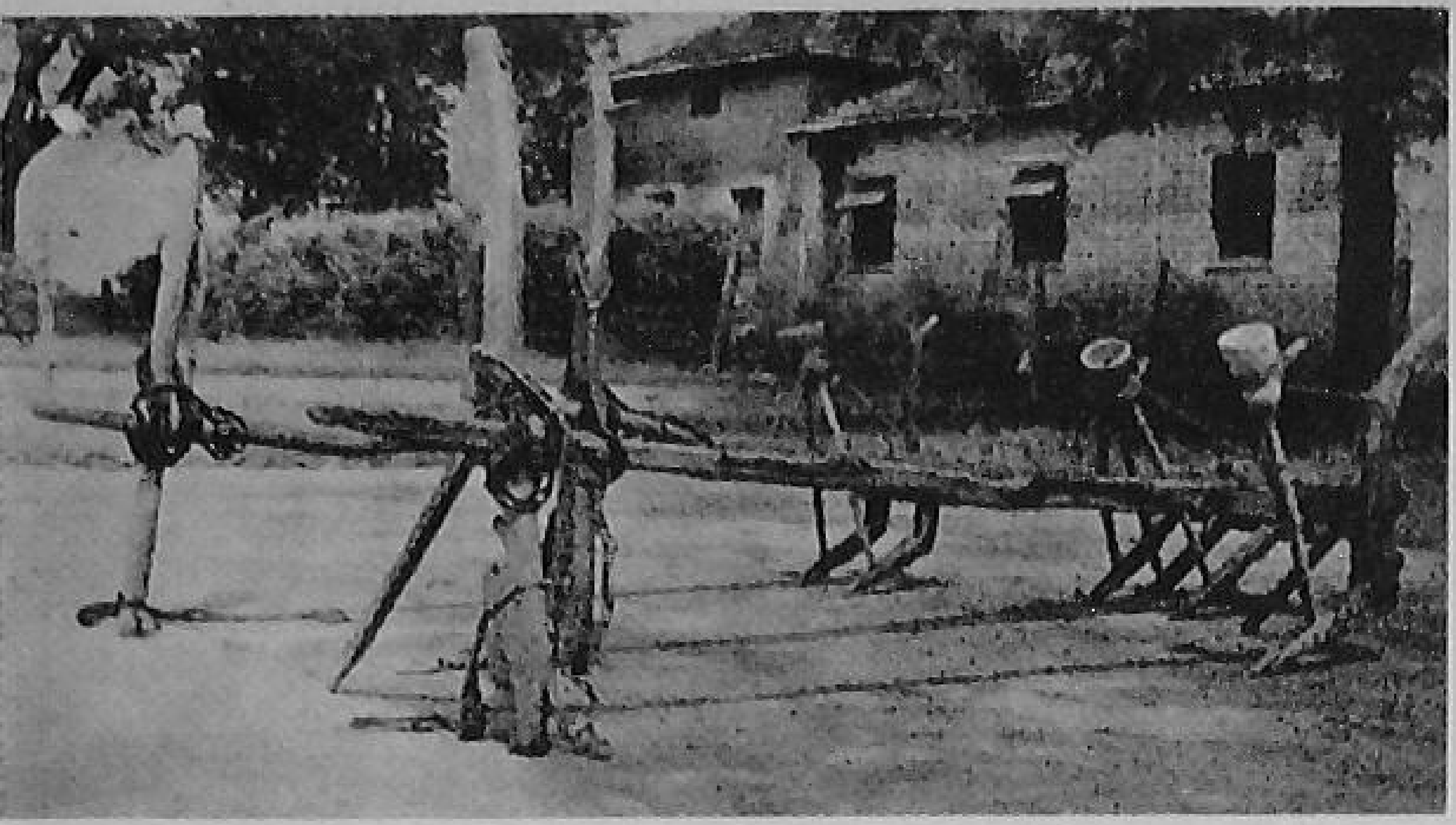
The wheat soil in the State being neutral, you can apply plenty of fertilizer to boost up the yield without any harm to the soil.

For an irrigated crop, apply 30 pounds each of nitrogen and phosphoric acid (as ammonium sulphate and superphosphate). If you have water enough, you can increase this dose to 60 pounds per acre with benefit. Give half the dose at the time of sowing, and the rest just before the first irrigation near the seedlings.

For an un-irrigated crop, use 15 pounds of nitrogen and an equal quantity of phosphoric acid, in one dose, at sowing.

For the crop raised under the *haveli* system (in embanked fields) reduce the dose of nitrogen as well as phosphoric acid to 15 pounds of each per acre. Apply at the sowing time.

Once in three years, apply cattle manure and compost to your wheat fields at 15 cart-loads per acre. Green manuring is another good and cheap means of adding organic manure to the field. Irrigated wheat responds



Some improved implements recommended for sowing the seed in lines

well to green manuring. Superphosphate at $1\frac{1}{2}$ maunds per acre given to the green manure crop will give a large amount of green matter. If you want to raise a green manure crop for an un-irrigated wheat, sow the seed before rains. It will be ready for ploughing under before the rains are over. Select *guar* for the areas with low rainfall and sannhemp for high rainfall areas.

IRRIGATION

The need for irrigation is more for bread wheat than for *durum* wheat.

Give the crop three to four irrigations of three to four acre-inches each. Three irrigations—one at the earlier stage, one at the root formation stage, and the third at the full bloom stage, are very important.

Avoid flood irrigation. If you do so, only about a fifth of the water you supply is actually used by the plants, and the rest goes waste. Moreover, while the low-spots in the field gets overirrigated, the higher spots get less or no water.

For a fairly level land, with a uniform slope, adopt the border strip method of irrigation.

In land having ups and downs, adopt the ditch method of irrigation.

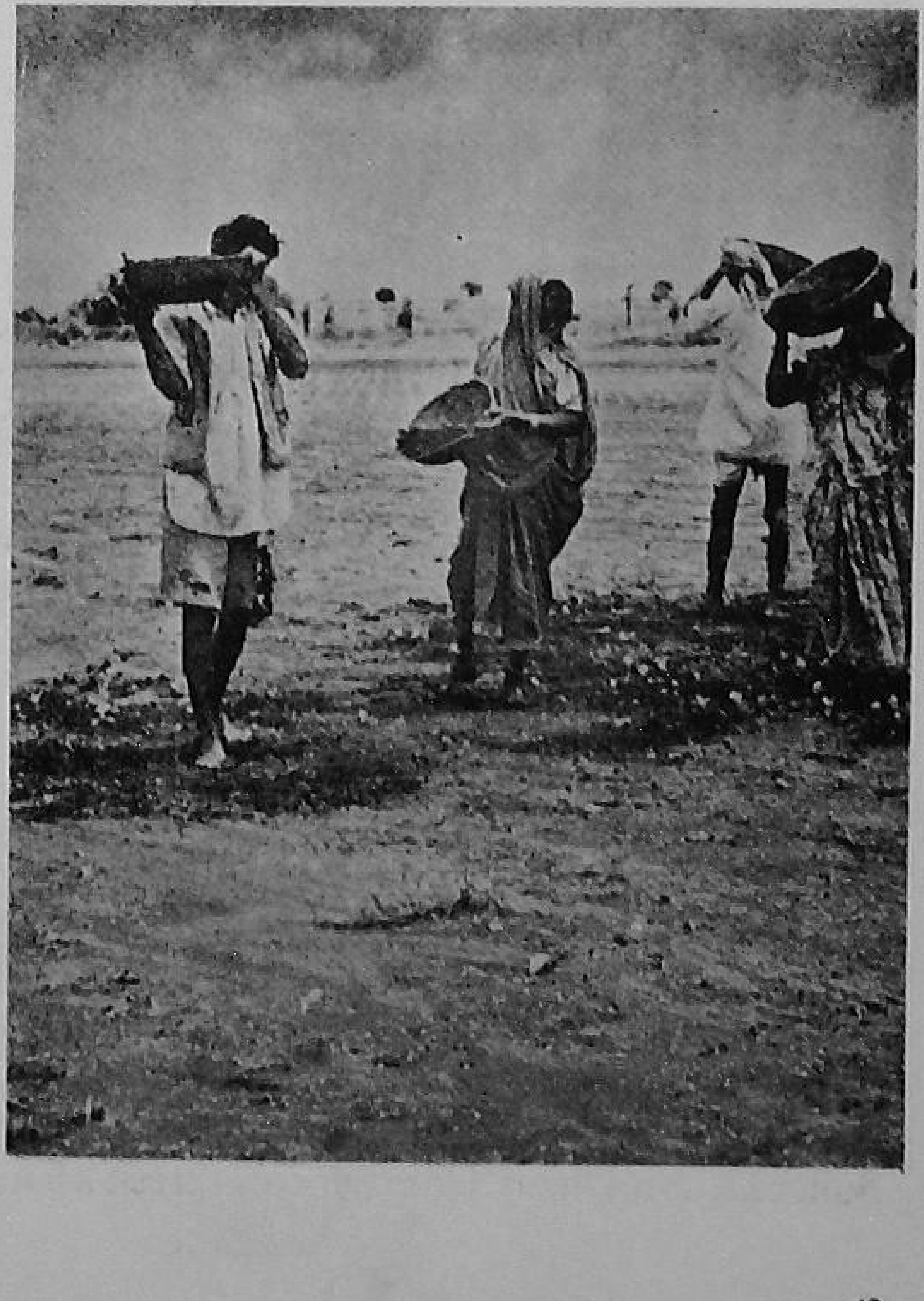
One dry hoeing after germination and weeding will suffice as intercultivation for wheat. It will conserve moisture and help the plants grow better.

DISEASES AND PESTS

Of the three rusts that attack wheat, black rust does the greatest damage. Till now brown rust was not very important in the State, but recently, it has also become serious.

Hence, always use a rust-resistant variety. Some new varieties having resistance to both black and brown rusts will soon be available.

Application of compost or farmyard manure to the fields, once in three years, is advised in the State



Another major disease is loose smut. The varieties distributed, except *C. 591*, *Hy. 38*, are fairly resistant to loose smut. If you have to use a variety which is susceptible to this disease, you can control it by the solar treatment of seed (to be taken up during the hot days of May or June before the monsoon. Soak the seed in water for 4 hours—from 8 a. m. to 12 noon on a clear day and expose it to the sun in a thin layer for thorough drying).

White ants are a problem in some parts, particularly under rainfed conditions. One or two timely irrigations, where facilities are available, would considerably check the damage. Crude oil emulsion at three to four gallons per acre, applied with irrigation water is quite effective in reducing the attack. Dusting 'Aldrin,' 'Dieldrin' or 'Chlordane' on the soil and mixing with a plough also gives good results.

In areas, where the crop is attacked by stem borer, spray wettable DDT (0.25 per cent) and burn all the stubbles.

If you have field-rat trouble, fumigate the rat burrows with 'Cyanogas' with the help of a foot-pump. But remember it should not be done near human habitations. Zinc phosphide mixed with wheat flour and groundnut oil is also used to poison the rats.

HARVESTING, THRESHING AND WINNOWING

Harvest when the crop is fully mature and the straw has turned yellow. Before harvesting, rogue out the unwanted plants. For threshing the crop, you can use a bullock-drawn Olpad Thresher instead of threshing by bullocks. An Olpad Thresher can thresh about 40 maunds of wheat grains in a day. Similarly, for winnowing you can use winnowing machines or fans for a faster job.

STORING

Clean and dry the grain well and store it preferably in concrete granaries. Spoilage in the usual storing methods has been found to be quite high.

To prevent insect damage in storage, dust the godown before storing with 10 per cent DDT (wettable powder). After storing, dust 10 per cent DDT in between the containers if you are keeping grains for seed or pyrethrum (pyrethrum 1600) for grains for consumption.

In case insect-infestation takes place, fumigate with "Chlorosal" (E.D.T.C. mixture) at 30 pounds per 1000 maunds of grain (24 hours for seed grains and 36 hours in case the grain is kept for consumption.)

In brief :

1. After the harvest of the previous crop, *bakhar* the field. Follow it by digging up the *Kans* (*Saccharum spontaneum*) and *Ber* (*Ziziphus* sp.) and heavy ploughing with an iron plough. Also, work the soil with a harrow or a *bakhar* whenever weather permits during the rainy season.
2. Apply farm compost at least once in three or four years.
3. Select rust-resistant varieties for sowing.
4. Treat the seed with 'Agrosan GN' before sowing.

5. Apply the fertilizer in two equal doses the case of the irrigated crop and in one dose with the seed during sowing for the un-irrigated crop. In no case should you keep the seed mixed with the fertilizer overnight.

6. Take a leguminous crop in rotation with wheat, at least once in three years.

7. Sow at the earliest opportunity when moisture and temperature are favourable.

8. In the case of an irrigated crop, give irrigation at early stages. You can give two to three irrigations depending on the availability of water.

9. Harvest at the right time, taking care to prevent admixtures of grains from different varieties.

10. Store the grain after drying it properly.

By adopting these practices and using a better wheat variety, Madhya Pradesh farmers can take their per-acre wheat yield high.

A good wheat crop—result of improved cultural practices

8 SURE STEPS TO MANY MAUNDS OF WHEAT

By T. C. KALA

IN RAJASTHAN, 71 maunds of wheat an acre is a big yield even if it is from the Ganganagar area, which is famous for its bumper crops. But there are steps that every farmer in Rajasthan can follow and which will result in many more maunds of wheat per acre.

1 **Sow at the right time.** Choose any time from mid-October to mid-November for sowing, depending on the local weather conditions. But never sow late. Late sowing leads to a smaller yield.

2 **Prepare your land well and keep it moist.** If you had left your land fallow during the *kharif*, plough regularly in August and September, with a plough or a *triphali*. Don't forget to run a plank.

In case your land is poor in fertility, don't leave it fallow. Grow a green manure, or a leguminous crop for green vegetables or fodder. Before raising the green manure or the leguminous crop, apply 15 to 20 seers of superphosphate to the field. This will increase the fertility of your land and cut down the cost on manure.

3 **Have a proper seed-rate.** If your's is a *peeval* (irrigated) land, sow 30 seers of seed to an acre, and if a *barani* one, sow only 25 seers.

Sow the seed in lines at a distance of 9 inches in between the rows in an irrigated land and at 12 to 15 inches in a *barani* land.

Use a seed-drill for sowing. With it, you can sow better and quicker.

4 **Grow improved varieties.** Select an improved variety for sowing. Ask your Gram Sevak or Agriculture Officer for a variety that is best suited to your area. The good varieties are:

R.S. 31-1 *R.S. 9-11* *N.P. 718*	For Jaipur and Jodhpur Divisions.
N.P. 718 *C. 591*	For Kotah and Udaipur Divisions and Ganganagar District.

5 **Treat the seed before sowing.** In June, treat the seed. Soak it in water and remove the floating earcockle galls. If loose smut is common in your area, treat the seeds quite ahead of the season, in May-June when the days are hot. Soak the seeds in water for three to four hours ; remove the seeds that float. Dry the remaining seeds completely in the sun and keep them in air-tight a container.

Before sowing, mix six tolas of 'Agrosan GN' with every maund of seed. This will prevent root rot and leaf smut diseases.

6 **Apply enough manures.** In irrigated lands, apply 15 cartloads of well-rotted compost and 3 maunds of superphosphate per acre. If you are short of compost you can apply 10 cartloads of it and 2½ maunds of ammonium sulphate or calcium ammonium nitrate instead.

Apply the compost as a basal dose while preparing the land. Place superphosphate and the nitrogenous fertilizer with the help of a seed-drill before sowing.

In unirrigated lands, apply 4 cartloads of cattle manure at the time of land preparation in September and 10 seers of nitrogen and 10 seers of phosphoric acid before sowing.

If you grow a green manure crop such as sannhemp or *guar* on your field bunds, you can get a cheap supply of a good manure. Harvest the green manure crop in August and turn it in the field.

7 **Irrigate well and in time.** How you irrigate will of course depend on the irrigation facilities you have. But here are a few tips you must not forget.

Give the first irrigation after 30 days of sowing. Before irrigating, intercultivate your field.

Seeing is believing—a farmer is seen examining the results of a demonstration

A farmer is disccussing with a Subject-matter Specialist the improved practices that lead to better yields

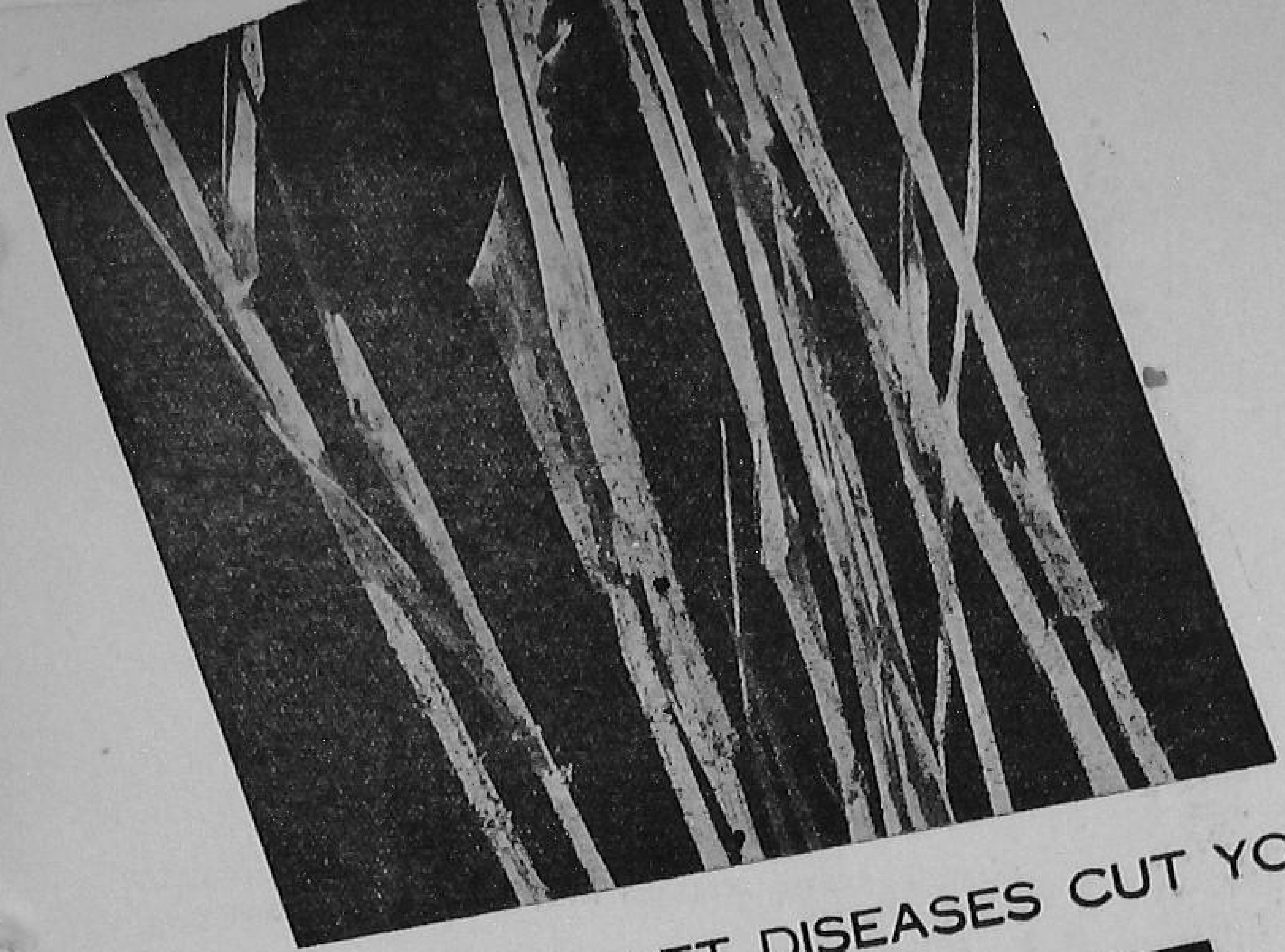
If yours is a sandy soil, give four to six light irrigations. But if it is a heavy soil, give only three to four irrigations, of three acre-inches.

8 **Take timely action against pests.** Dust 10 per cent BHC or 2 per cent 'Aldrin' at 10 seers an acre before ploughing. This will conrol the white ants.

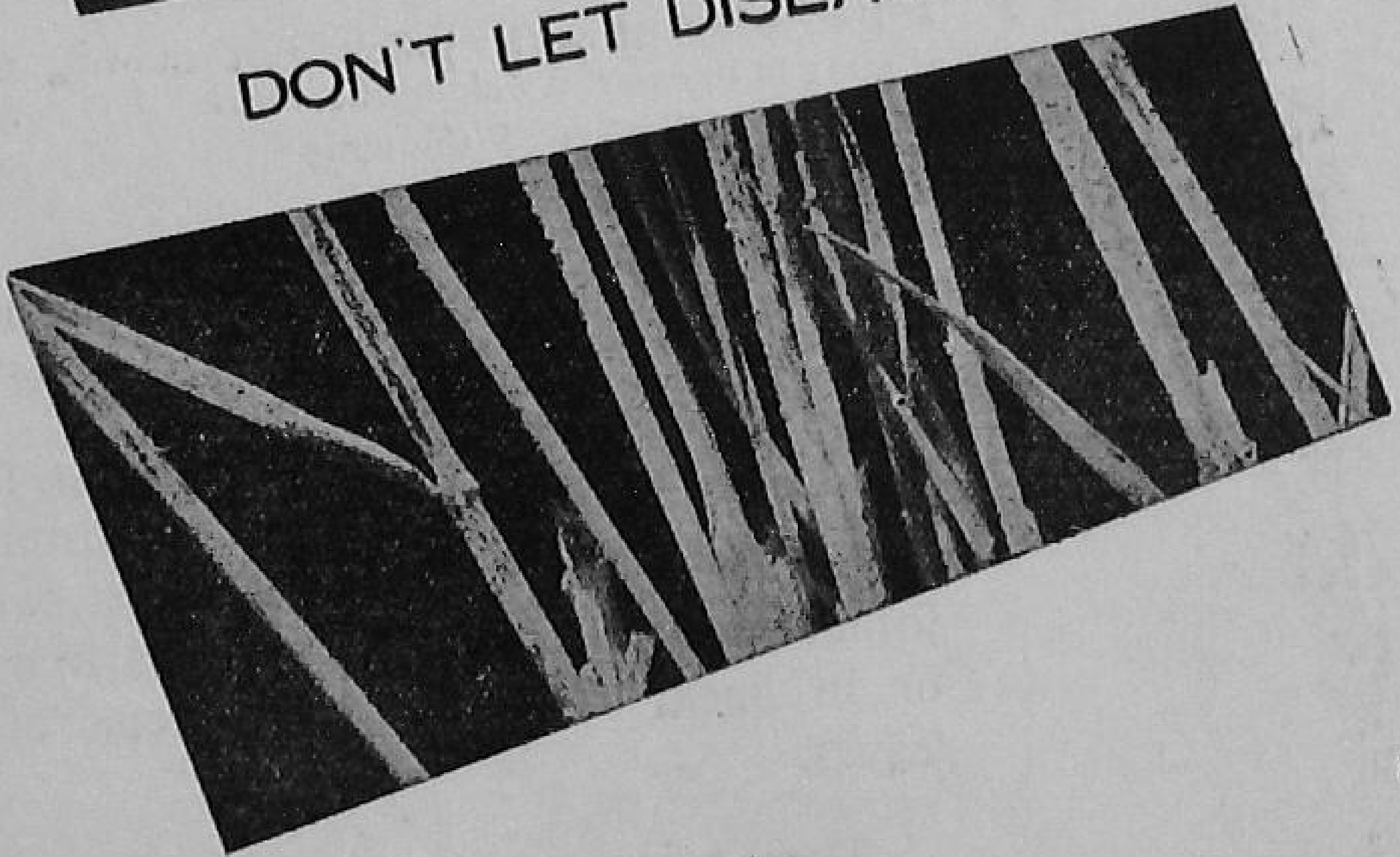
To destroy weeds, spray 2,4-D within two months of sowing at 10 *chhataks* mixed in 15 tins of water per acre.

These eight tips won't cost you much in time, money or labour, but they will pay you with a bumper wheat-yield.

Improved practices have rewarded farmers with a bumper wheat harvest



DON'T LET DISEASES CUT YOUR WHEAT OUTTURN



By R. PRASADA and B. L. CHONA

WHEAT diseases cause anything from some loss of crop to complete crop failures. The total loss this way to the country runs into crores of rupees a year.

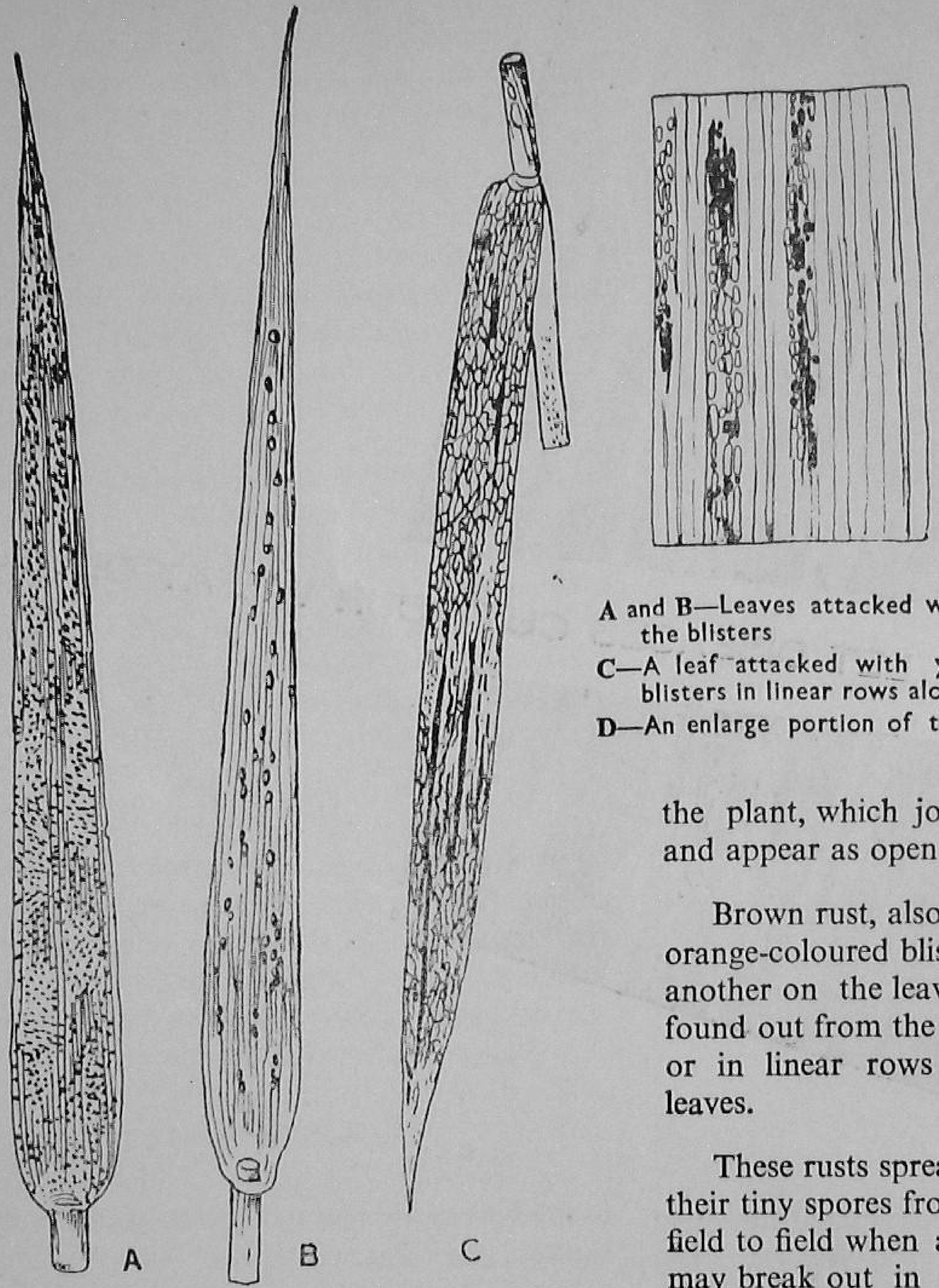
Every farmer, therefore, should know the diseases, what to do about them, and how to raise disease-free wheat crops. Here are the more important diseases that attack wheat.

RUSTS

Rusts are the major enemies of wheat crop. This disease multiplies on wheat crop in the hills and is spread to the plains every winter.

There are three rusts that occur on wheat in our country and they are commonly known as yellow, brown and black rusts. They get their names because of the colour of the spores (minute germs) within the blisters they produce on the wheat plant. These rusts are locally known as *rati*, *ratua*, *gerua*, *tambera*, etc.

Out of the three rusts, yellow rust is the first to appear on the wheat in the plains of



A and B—Leaves attacked with orange rust, showing the blisters

C—A leaf attacked with yellow rust, showing the blisters in linear rows along the veins

D—An enlarge portion of the same

north India, followed by brown and black. In the South and Madhya Pradesh, black rust is found more, brown rust is occasional and yellow rust almost never appears except in the Nilgiris and the Palni hills.

You can make out black rust, also known as stem rust, this way. It forms big blisters on the stem, leaf and leaf-sheath of the plant, which join together subsequently and appear as open black channels later on.

Brown rust, also called orange rust, forms orange-coloured blisters separated from one another on the leaves. Yellow rust can be found out from the blisters formed in stripes or in linear rows along the veins of the leaves.

These rusts spread very fast by means of their tiny spores from plant to plant and from field to field when a dry wind blows. Rusts may break out in an epidemic form in as short a period as four to six weeks if the weather is favourable to them.

HOW TO CONTROL

The most effective and economical method of controlling all these rusts is to grow varieties of wheat which are resistant to them. Quite a number of rust-resistant wheats and several rust-tolerant varieties have been evolved in India and released for general

cultivation. These varieties have done very well in different states and given much higher yields than the local varieties. Consult your local Agriculture Officer or Gram Sevak in selecting the variety that would suit best your area. Some of the varieties are :

For the plains : *N.P. 710, N.P. 718, N.P. 792, N.P. 798, N.P. 824 and N.P. 825*

For the hills : *N.P. 770, N.P. 792, N.P. 809* and *Ridley.*

LOOSE SMUT

Loose smut is very common in the plains of north India, particularly in the Punjab and western Uttar Pradesh. It is also found frequently in the hills of north India.

Plants attacked by loose smut come into ears much earlier than the healthy plants.

Loose smut-affected wheat ears (*on the right*) show black mass of powdery spores in place of grains as in a healthy ear (*on the extreme left*)

Such diseased plants can also be found out from the earheads which contain black mass of loose powdery spores in place of grains.

Since loose smut is a seed-borne disease, better treat the seed with the solar-heat method. On a hot summer day during May-June, soak the seed thoroughly in water for four hours in the morning. Spread it out on a clean floor in thin layers in the hot sun. Let it dry till evening.

Store the treated seed in bags till required for sowing in October-November. This solar treatment is effective, cheap and simple. Any cultivator can do it without any risk. This treatment does not affect the germination of the treated seed. You can also grow smut-resistant varieties namely *N.P. 710, N.P. 718, N.P. 797, N.P. 798, N.P. 799* and *N.P. 824.*

BUNTS

Bunts get their name from the burnt look of the affected grains. The disease appears in the grains and gives a foul odour to the attacked grains with the result that the market value of the wheat flour goes down. A wheat crop affected with bunts gives a poor yield.

There are two types of bunts in the country—hill bunts, common in the hilly areas, and the partial or Karnal bunt, common in the submontane areas of the Punjab, Delhi and western Uttar Pradesh.

When the hill bunts attack, they damage as much as 40 to 50 per cent of the crop. The germs of the bunts are carried on the seed. So treat the seed with 'Agrosan GN,' 'Tritisan' or any other organo-mercurial compound.

Karnal or partial bunt, as its very name indicates, affects only a few grains in the ear

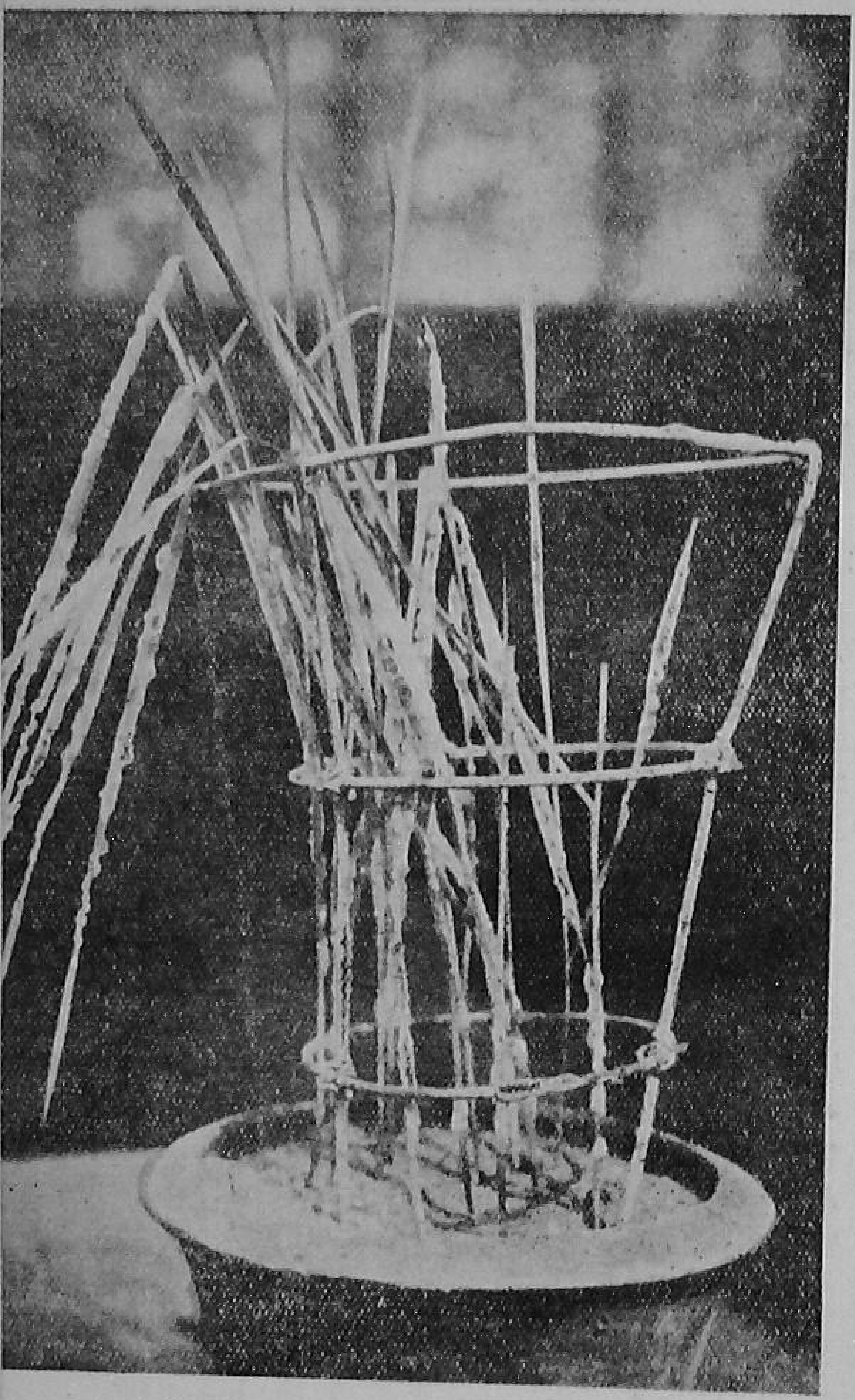
A high temperature helps in the spread of the disease. Hence, sow your wheat late, towards the end of October or early November. This will reduce the attack of the disease. Also treat the seed with 'Agrosan G N' or 'Ceresan' at 0.3 per cent.

POWDERY MILDEW

Powdery mildew is a serious disease in Uttar Pradesh and West Bengal. It is also present in the Nilgiri hills.

A high humidity and a moderately low temperature help in the spread of the disease. The lower surface of diseased leaves appears to be covered with white powder. It is made up of minute spores or the germs of the disease. They are quickly spread from plant to plant when the weather is dry.

For complete control, dust the crop with finely-powdered sulphur. Most of the new



Wheat plants affected with powdery mildew

Wheat plants showing *Alternaria* leaf blight

and that too only partially. It is not so widespread. Uproot and destroy the bunt-affected plants if there are any in your field.

HELMINTHOSPORIOSE OR LEAF-STRIPE DISEASE

Due to the disease, long brown spots are produced on the leaves, leaf sheath, ear, awn, etc. In some cases of attack, the roots and the base on the stems become brown and the attacked plants die.

N.P. varieties (700 and 800 series) are less susceptible to the disease than the older varieties (*P.4* and *P.52*). So, better grow such varieties.

ALTERNARIA LEAF BLIGHT

In Maharashtra, *durum* wheats, especially *Kenphad* varieties, are seriously attacked by *Alternaria* leaf blight.

The leaves of the infected plants show a burnt appearance. It is found that only mature leaves are attacked. The infected plants give a poor yield.

Kenphad varieties, *Niphad-4*, *Hybrid 65*, *N.P. 828*, *N.P. 829* and *Kathia* are highly susceptible, whereas *N.P. 710*, *N.P. 718*, *N.P. 798* and *N.P. 824* are resistant varieties. So grow a resistant variety suited to your area.

EARCOCKLE OR *TUNDU*

This disease is common in the Punjab, Delhi and eastern Uttar Pradesh. To control this disease, remove galls from the seed by the floatation method. Avoid growing wheat in the infected fields in successive years.

MOLYA

This is the most serious disease of wheat in the light soil regions of Rajasthan. The diseased plants are stunted, the roots are affected noticeably and there is a poor tillering. The disease in the beginning occurs in patches of varying sizes but ultimately spreads throughout the whole field.

The disease is caused by eelworms which live in soil. You can control this disease by fumigating the affected soils with D-D, though it means a good amount of cost and labour and needs special care of the land before and after the application of D-D. You can try this method when the disease is confined to a very limited area.

Earheads of wheat affected by *tundu*. On the extreme right is a healthy earhead

A good rotation of crops will help you avoid the disease. Wheat or barley taken after a one-year-fallow or after a crop of carrots, gives good yields as compared to the field where no rotation was followed. Follow this rotation for three to four years and you can get an almost *molya*-free crop.

Now that you know your wheat enemies and how to tackle them, better be on your guard and raise disease-free wheat crops.

By D. B. REDDY

PESTS THAT ATTACK WHEAT IN THE FIELD AND STORE

Pests attack the wheat crop in the field, but they are usually not so serious as those which attack wheat in the store or in the godown. Sometimes, however, the field pests also become very serious and cause heavy loss of crop.

All your labour and efforts in growing wheat may go waste if you are not careful about these pests. Hence, you should know what these wheat pests are, and take quick control measures to save your crop when they attack it.

FIELD PESTS

Termites (white ants)

If you have been growing wheat in the North, you must have seen a few dead plants here and there in the field. If you have tried to uproot such plants you must have found that they are cut at their roots or at their bases. Such a damage is caused by the termites or white ants. Termites can cause more serious damage to your wheat crop when it is grown on light soils and is not frequently irrigated.

Termites live in the soil and attack wheat plants—both young and grown-up.

How to Control

Take control measures before sowing your crop. While finally preparing the land for sowing, dust about 20 pounds of 5 per

cent BHC, or 'Chlordane', or 'Aldrin' or 'Heptachlor' and work it into the soil with a cultivator or plough. If you, however, find the termite-attack after the plants have come up, irrigate the field immediately.

Termite - mounds are often seen in the wheat field. The queen of termites lives deep down in these mounds. Remove these mounds if you find any. While removing a mound see that you have dug deep enough to remove the mound with the queen. Dust the site and the mound with 0.1 per cent 'Aldrin' (water solution) at the rate of about one litre per cubic foot volume of the mound.

Gujhia Weevil

Wheat farmers of the Punjab, Rajasthan and Uttar Pradesh suffer very often from the attack of *Gujhia* weevil on their crops. These weevils cut the seedlings when they are very young. At times the damage is so heavy that the entire field needs resowing.

Gujhia is a small weevil, about 1/4th inch long and brownish in colour. It hides under soil clods and rubbish and is active during mornings and late evenings.

How to Control

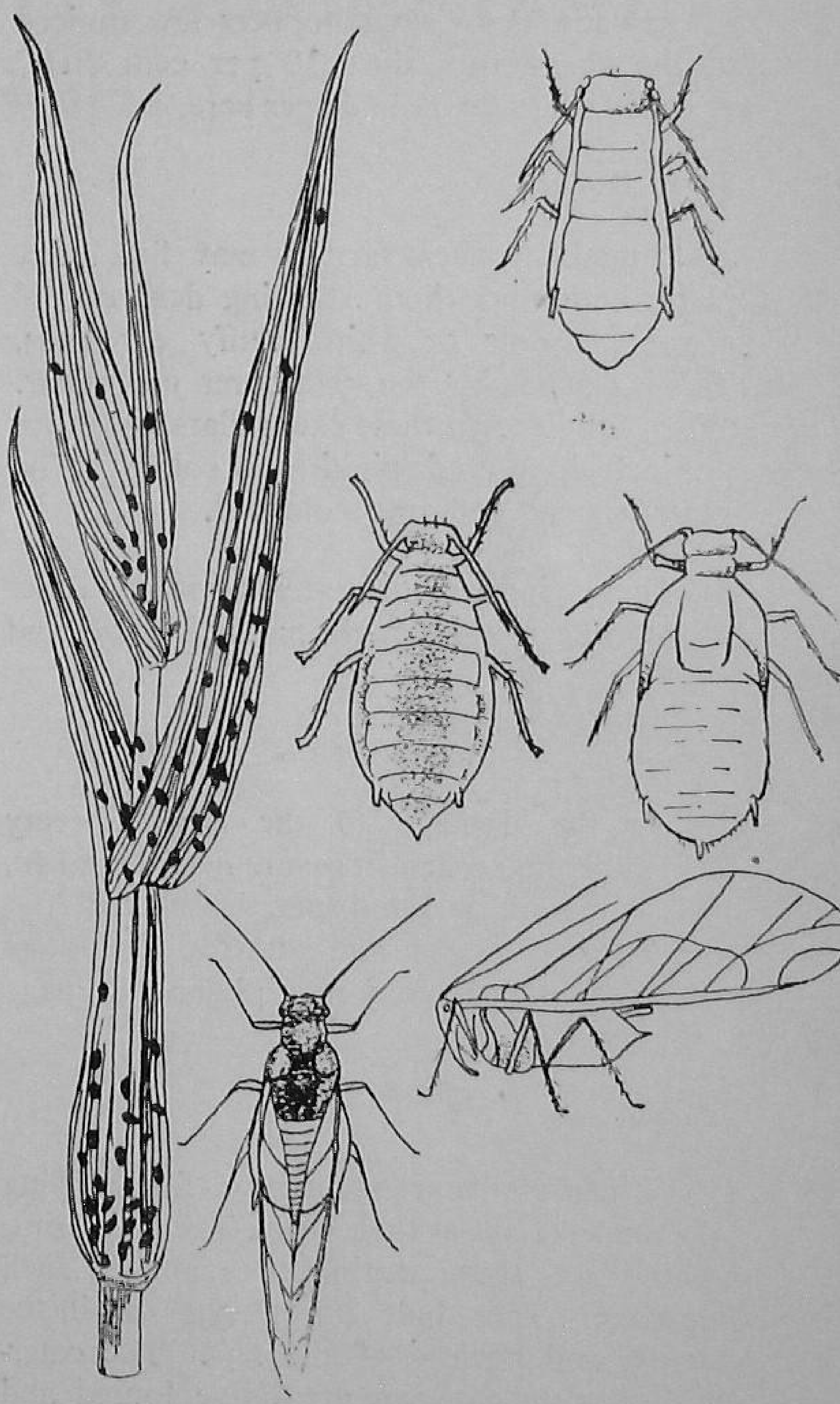
Keep a watch over the pest. As soon as you notice any in your wheat field dust the crop with 10 per cent BHC or 5 per cent 'Aldrin' at the rate of 20 to 30 pounds an acre. Rake the insecticide into soil.

Aphids

Aphids are yet another pest which our wheat farmers often find on their crops, especially when the weather is moist and cloudy. These are small, green-coloured insects found in clusters on wheat leaves, shoots and ears. They suck the juice out of the leaves and other tender parts of the plant and make them weak. The pest may cause serious damage if the attack is in the early stages of the crop, for such plants may even die. When the ear-heads are attacked, they give light and poor quality grains.

How to Control

You can control the pest by dusting 10 per cent BHC or any other such insecticide at 20 pounds an acre.



Grasshoppers

The small dull brown grasshoppers that you may find on your wheat crop can cause

considerable damage when they attack a young crop in large numbers. Both the young and the adult grasshoppers eat the tender wheat leaves. If they are not controlled in time, it may be necessary to sow the crop once again.

How to Control

As soon as the grasshoppers are noticed on the wheat crop, dust 10 per cent BHC at about 15 to 20 pounds per acre.

Stem Borer

Sometimes wheat farmers may find a few plants here and there showing dead central growing shoots or white chaffy ear-heads. This is caused by the stem borer caterpillar. When fully grown these caterpillars are about an inch long and pinkish in colour. The moth is small and grass-coloured.

These insects also attack many other crops like *jowar*, ragi, paddy, maize and sugarcane.

How to Control

As the damage to the crop is very negligible, no control measure need be taken. It is, however, a good practice to pull out the affected plants and destroy them, as otherwise the pest may multiply and damage other crops.

Cutworms

Wheat plants are sometimes found lying on the field, cut at their bases. The cutworms, which are active during the night, do such damage. They hide during the day in the cracks and crevices of the soil. The caterpillars of the cutworm are dark-coloured and are of medium size. Besides wheat, crops like gram, peas, tobacco, potato, groundnut and barley are also attacked by this pest.

How to Control

Ten per cent BHC or five per cent DDT dust will control this pest. While dusting see that the bases of the plants are dusted thoroughly.

Armyworms

Wheat growers, mostly in hill areas, find armyworms on their crop. Mediumsized, dusky coloured caterpillars of these pests eat the leaves. They, generally, are found moving in swarms from one field to another. They also attack other crops like paddy and *jowar*.

How to Control

Keep a watch over the pest and locate it early on your crop. Dust 10 per cent BHC or any such similar insecticide at 15 to 20 pounds per acre.

Rats

Rats are a great nuisance to the wheat-growers. They cut the plants—young and old. They make burrows in the fields and bunds and also damage irrigation channels.

How to Control

In order to control the rats effectively, all the farmers of the village must take control measures jointly.

In the field, bait the rats with poison. Mix three parts of zinc phosphide with 97 parts of *bajra*, crushed gram or maize. Add a little vegetable oil and make small balls. Place these poison baits in live burrows. Warfarin, Coumarin, etc., are other poisons that are used for killing rats.

As zinc phosphide is highly poisonous, handle it with care and better consult your Agricultural Officer or the Gram Sevak in the preparation of the bait and its use.

To control field rats you can also use traps with advantage.

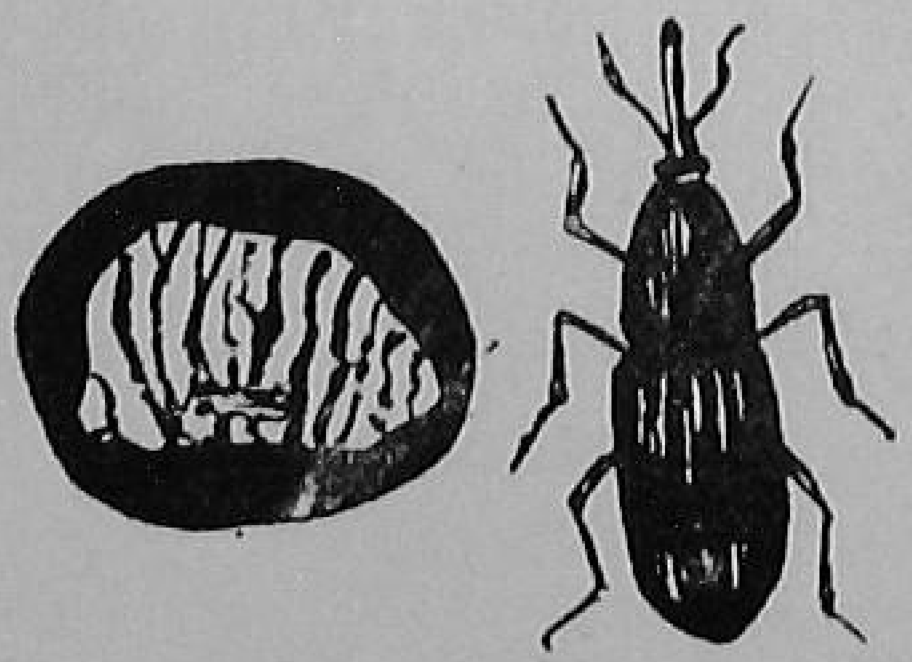
STORAGE PESTS

After keeping wheat in storage, very often, our farmers find a good amount of grain, if not all, completely spoiled.

As a matter of fact, insects, rats and moulds all attack wheat in storage and cause heavy losses to our farmers. Among these, insects are the most important pests.

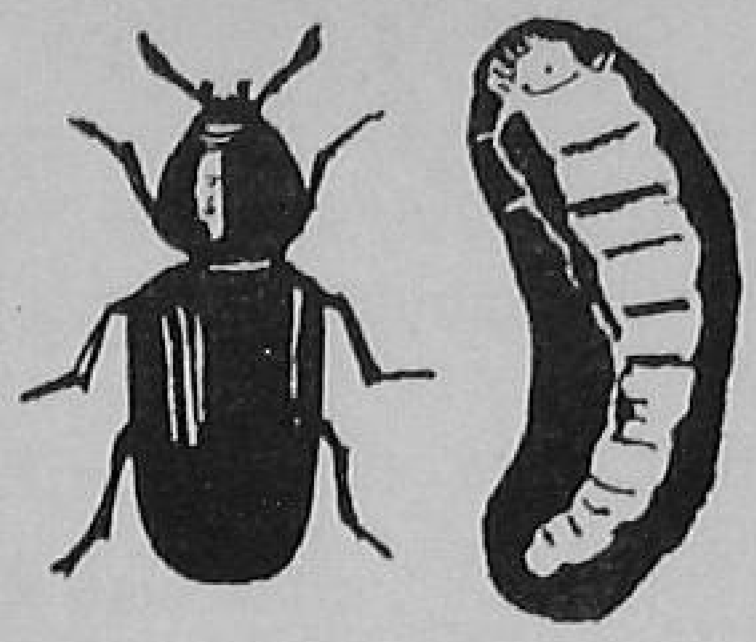
One may wonder how a newly-harvested crop is attacked by insects so soon after storing. Weevils and other storage insects live inside cracks and crevices in walls, floors, ceilings, etc. They also remain unnoticed in the storage receptacles. They can also come from the sweepings and rubbish lying near the stores. They can hide under dunnage and in the meshes and seams of bags. A new harvest can be attacked by insects from the old infested wheat either when it is mixed with the new wheat or when it is lying around. Sometimes, the new harvest can even get infested right in the threshing yard. The important storage pests of wheat are :

Rice Weevil



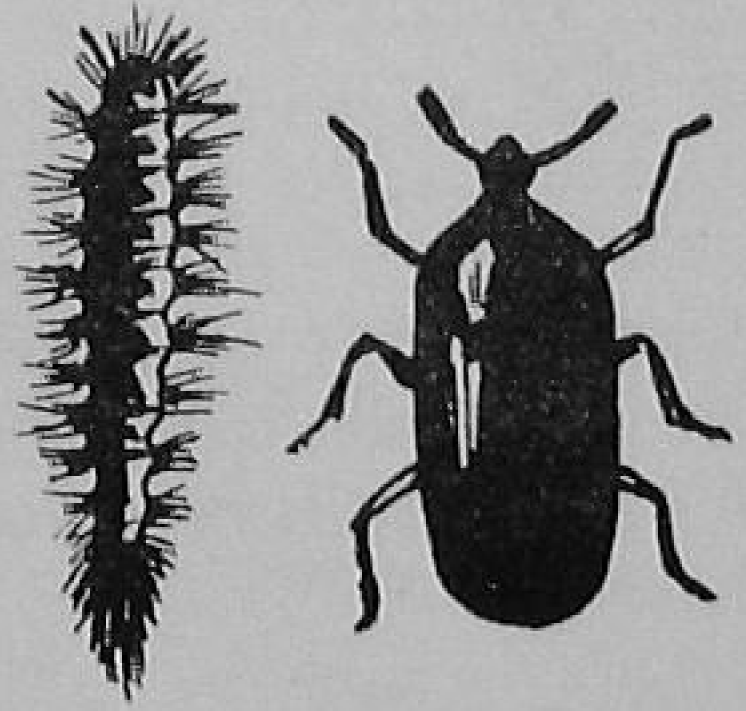
It is a small, dark brown beetle with a long snout. It has four light reddish or yellowish spots on the upper surface of its body. The adult female bores a hole in the grain with its snout. Both larva and adult cause damage to the wheat grain.

Borer Beetle



The beetle is dark brown in colour and cylindrical in shape. The head is bent. It is smaller than the rice weevil. Both adults and larvae damage wheat and other stored grains.

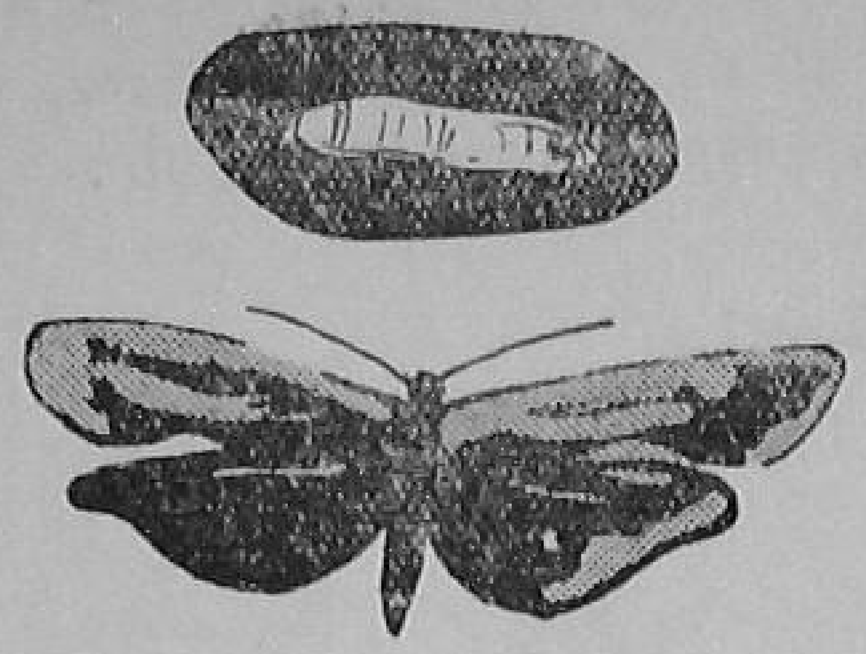
Khapra Beetle



It is a tiny beetle, oval in shape and with grey and light brown markings. Only the larvae eat the grain. The larvae are whitish brown and are covered with bundles of hair; a sort of a tail of hairs is also formed.

OTHER INSECT PESTS

The other insects which attack stored wheat are grain moth, rust-red flour beetle and saw-toothed grain beetle.



Grain moth

How to Control Storage Insect Pests

Remember that clean wheat should be stored in clean places. Before you store the harvested crop in earthen pots, *khattis*, *kothas* underground pits, bags, rooms or any other type of storage receptacles, see that they are thoroughly cleaned and the sources of infestation removed. Dispose the cleanings ; and the sweepings from the old stocks do not throw them near the store.

All cracks, crevices, etc., in the storage godown should be filled. Get the store white-washed. Disinfest it with insecticides like BHC or DDT (at 0.4 per cent) at 1 gallon per 100 square feet before storing wheat.

Dry wheat properly in the sun before storing it, for wheat with a moisture content higher than 10 per cent is easily attacked by insects and moulds.

Do not mix the new harvest with wheat already in storage for sometime.

Inspect frequently the stored wheat, specially during the rainy season, so that control measures can be taken in time.

Do not keep the storage receptacles in places where they are exposed to high humidity and splashes of rain. The godowns should be damp-proof, leak-proof and rodent-proof.

Place the storage receptacles or the bags on a dunnage either of seasoned wood, or bricks or stones.

Where possible the wheat should be sun-dried once or twice. This reduces infestation.

In case wheat is infested in storage, you can use E.D.C.T. mixture at the rate of 30 pounds per 1000 cubic feet of space or methyl bromide at 1 to 2 pounds per 1000 cubic feet of space.

Dust lightly the outside of the bags and the storage receptacles with 5 per cent BHC at the rate of 8 ounces per 100 square feet of area to prevent entry of insects from outside.

Do not mix insecticides with stored wheat.

Rats

Rats cause more loss by spoilage than by actual consumption. They make burrows in *kutcha* houses and a lot of grain is stored these burrows. They are found causing loss throughout the year.

To control rats take regular measures. Use traps and poison baits but poison baiting should be done only under expert advice and by experienced persons. Under no circumstances, poison bait should be allowed to be mixed with the grain.

Moulds

Moulds cause damage by making the grain unfit for seed as well as for consumption. Stored wheat get mouldy if the grains are not thoroughly dried before storing and the godowns are damp and hot.

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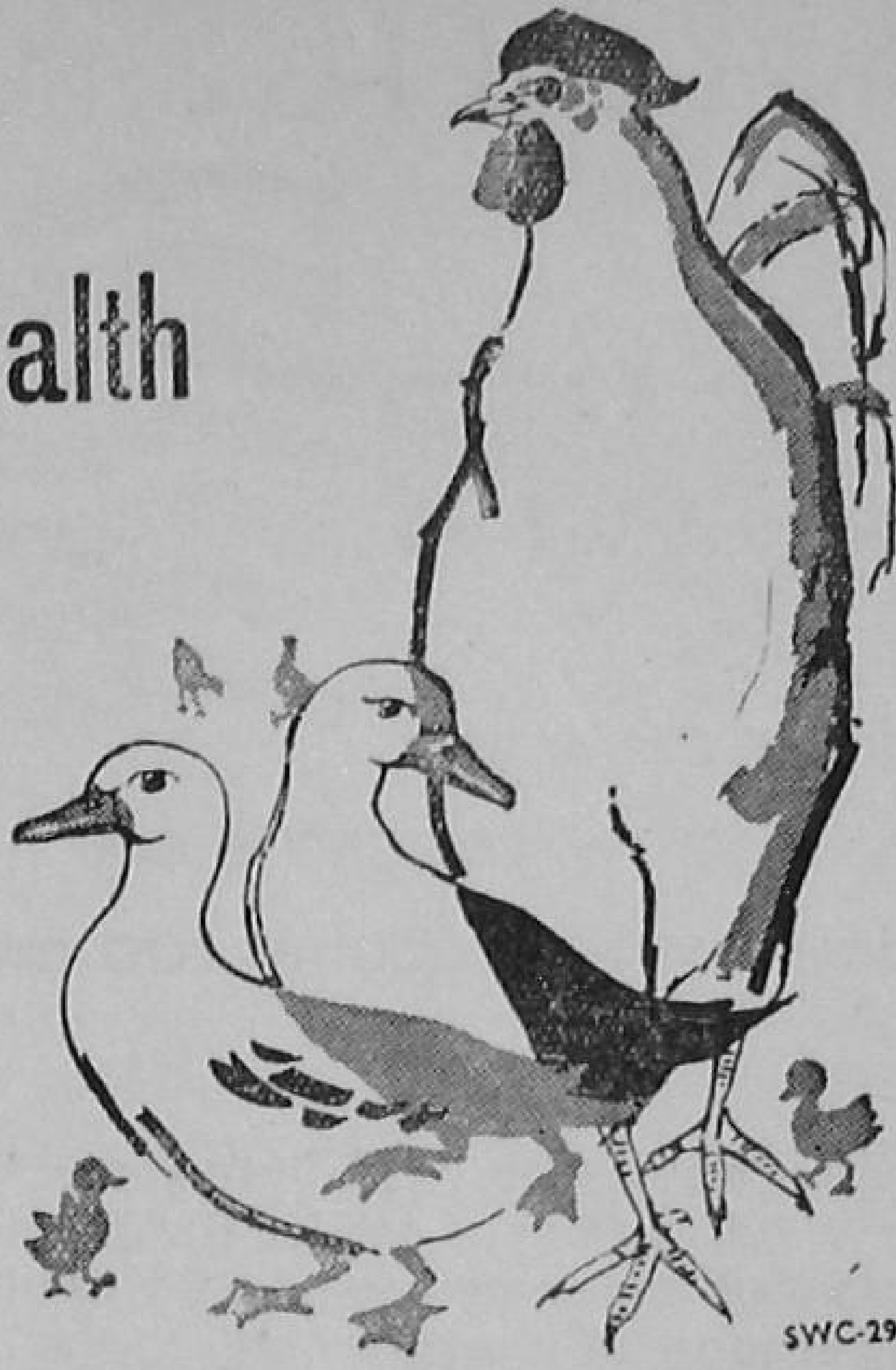

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The When and How Much of WHEAT IRRIGATION

By D. S. DHESI

Do you know how water helps plants grow up?
Or how much water can a soil hold?
Or when does water become too much or too little for a crop?

YOUR soil is a reservoir of plant foods and moisture. Water acts as a carrier for plant foods. Some of the water remains within the plants but most of it escapes into the atmosphere. How fast it evaporates depends upon many factors like temperature and humidity.

As long as there is enough water in the soil, plants keep on growing. But they start wilting and withering away if there is not enough water in the soil. Thus, there should be enough water in the soil to keep the plants always green and growing.

But the soil cannot hold water beyond a certain limit. Excess water will, therefore, go deep into the soil and thus will be lost to the crop. An excess of water will also create conditions which are not favourable to a good growth of plants.

How much water a soil a can hold depends on its texture. Coarse-textured soils contain mostly sand and can hold $\frac{1}{2}$ inch to $1\frac{1}{2}$ inches of water per one-foot depth of soil, whereas medium-textured soils which contain moderate amount of clay and a larger amount of sand can hold $1\frac{1}{2}$ to 2 inches of water.

Fine-textured soils have more of clay and less of sand. That's why these can hold $1\frac{3}{4}$ to $2\frac{1}{4}$ inches of water.

Now let us see how much and at what stage the wheat needs water so that it grows best.

SOWING

The soil to help the plants grow well needs to have good moisture in it when you sow the seed. So you must start early and see that you have conserved enough moisture during monsoon.

In case the rains have failed or there have not been good rains, give a pre-sowing irrigation.

GERMINATION

You need not give any irrigation during the germination period. In fact, even rain at this stage may harm the young plants; for, rains help form a soil crust which does not allow the young plants to come out of the soil.

Therefore, if you see any crust forming, break it with some suitable implement. And in case you find germination very poor, it is better to resow the field.

TILLERING

If you have already irrigated the field before sowing, the first irrigation given a month after sowing will be just in time for better tillering.

The crop will thus get water when it needs it most for good tillering—25 to 60 days after sowing.

VEGETATIVE GROWTH

After tillering, comes the vegetative growth. Give another irrigation during this period also.

FLOWERING

Do not give any irrigation during flowering.

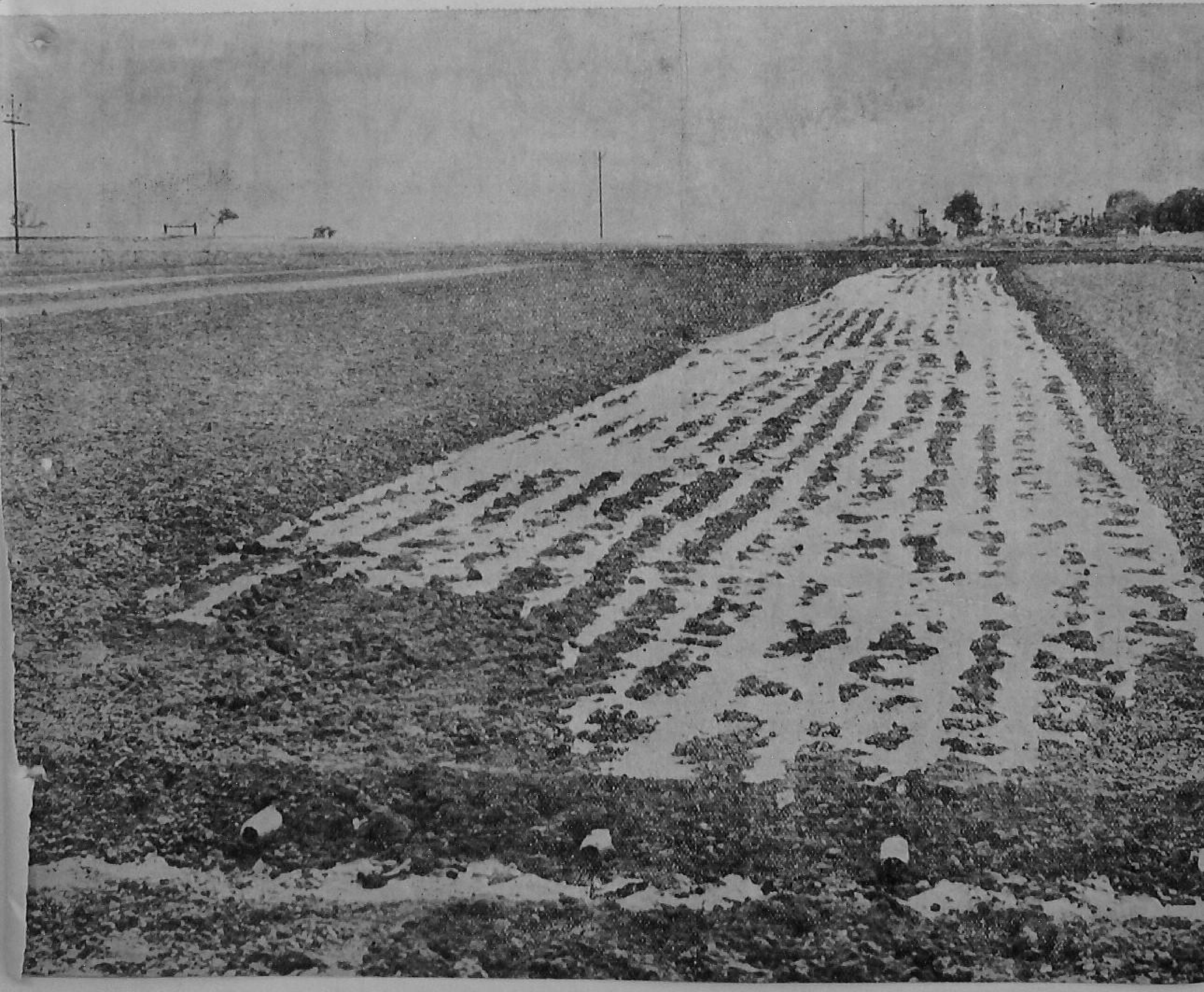
GRAIN FORMATION

This is the stage when the crop needs irrigation most. See to it that the soil does not suffer from any shortage of moisture.

This in short is a guide as when to irrigate your wheat land. For exact requirements of your crop, you are the best judge. Always keep a close watch on your soil to see when it needs irrigation.

And remember that the crop requires more and more water as it goes on growing till it requires maximum irrigation during the grain-formation stage.

See that your field gets just the right quantity of water and at the right time



By R. D. VERMA

2,4-D can end weed trouble in WHEAT

THIRTY eight crores of rupees is surely a large amount. But that's exactly the amount wheat farmers in India lose every year because of weed trouble in their wheat fields which brings down the yield by as much as nine lakh tons.

Every farmer knows, weeds are a great robber, robbing the wheat crop of nutrients, water, light and other requirements so necessary for healthy growth of the crop. But how does he go about destroying this deadly enemy ? Usually by hand-weeding or

interculturing with the help of bullock-drawn implements.

Now, hand-weeding, no doubt quite effective, is a laborious, slow and costly operation. And intercultivation with bullocks, though quicker and cheaper, is definitely not very effective. For weeds, which are close to the plant and do the greatest damage, remain unharmed. And also there is every likelihood that you may damage the root system of the crop while weeding.

This is where 2,4-D comes in. This is a weedicide that offers to wheat farmers an easy, effective and economical way of destroying weeds like *bathu, piazi, hiran khuri, pitpapra, krisnanil and pohli*. And what's more, it is quite safe to use; for it is quite harmless to both human beings and animals. 2,4-D has certain other advantages also: some of these are :

- *It will cost you not more than Rs. 7* (Rs. 3 for the weedicide and Rs. 4 for the two men employed for spraying) per acre as against Rs. 16 to 20 for employing eight to ten men in hand-weeding.

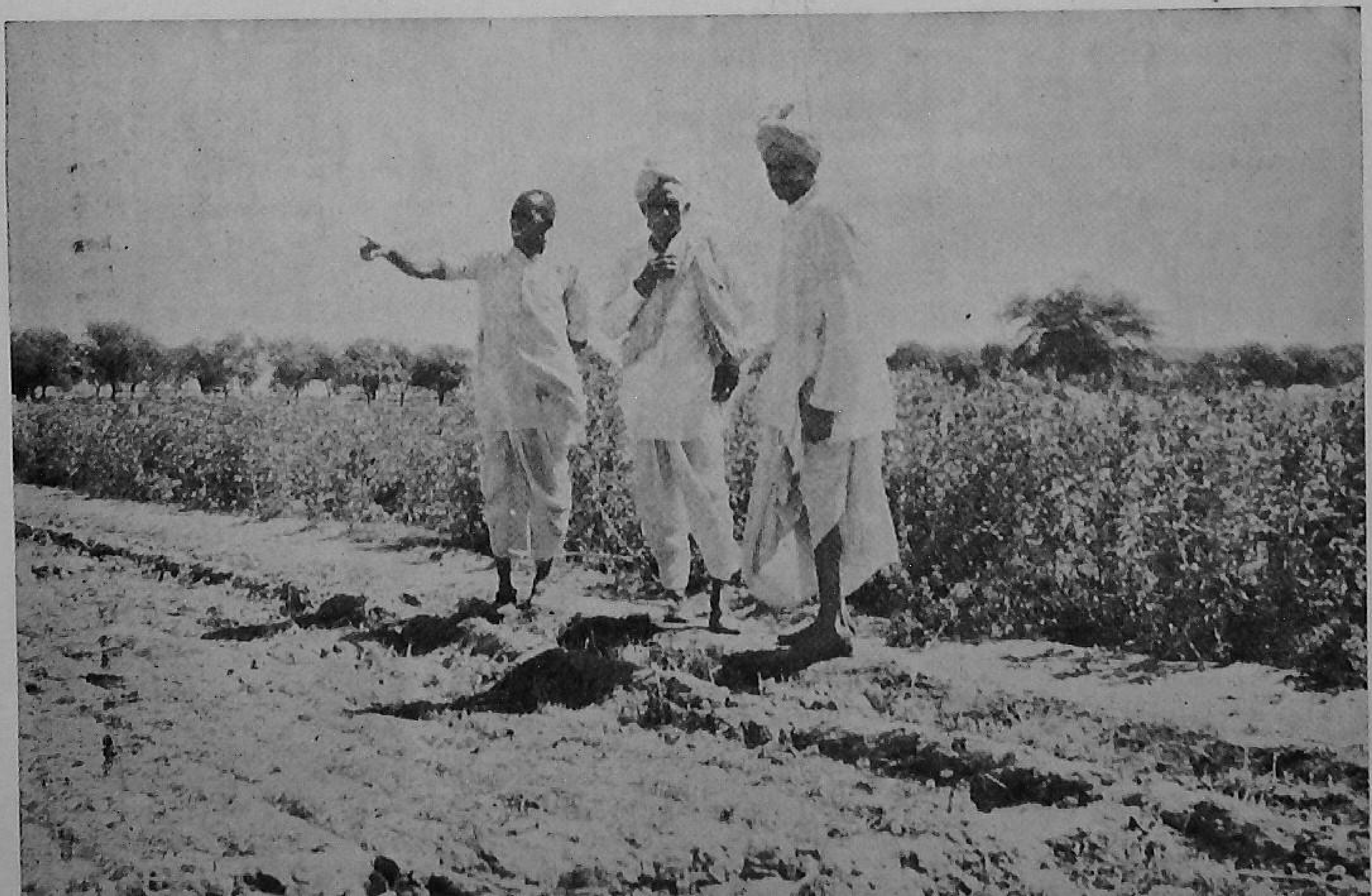
- *It is easier* also to spray 2,4-D than to do hand-weeding or interculturing with a bullock-drawn implement.

- *You can do the job faster, also.* Just two men can cover an acre in a day as against eight to ten men required to hand-weed an acre.

- *You can destroy all the weeds* no matter whether they are in the crop rows or between them.

- *With 2,4-D, you destroy the weeds more effectively* and no fresh weed seeds will

The farmers are discussing happily the result of the application of 2,4-D in the wheat field. (The field in the fore ground) shows that 2,4-D has completely smothered the weeds; whereas part of the same field (at the rear) shows heavy weed growth which did not receive 2,4-D treatment



germinate afterwards. Whereas in interculturing, deeply buried weed seeds may come up to the surface and germinate.

- *With 2,4-D, you avoid the possibility of bullocks trampling over the crop* or damaging the roots of plants.

- *You can use 2,4-D any time you like* provided there is no rain within six hours after spraying.

WHEN AND HOW TO APPLY

Spray the crop between 40 and 50 days of sowing, preferably after irrigation. This is the stage when tillering is over but the tillers have not yet started growing.

Spraying 2,4-D earlier or later than this period may damage your wheat crop.

Spray one pound (acid equivalent) of sodium salt of 2,4-D. If amine or ester formulation of 2,4-D is used, the dose should be reduced to 12 ounces and 8 ounces per acre, respectively.

For exact requirements in your area, consult your Gram Sevak or Agriculture Officer.

Divide the field into long strips, 10 to 12 feet wide. For this, you can fix pegs at suitable distances on opposite sides of the field and stretch a string across the field. Very often, bunds made for irrigation can serve the purpose just as well.

Prepare the spray this way. Put the required quantity of weedicide in a container. Add a little water and mix it well so that there are no lumps. To this mixture, add as many tumblers of water as there are strips to be sprayed.

Take out a tumbler of this mixture and add it to a bucketful of water. Spray it uniformly over a strip. This way cover all the strips. You will find that 50 to 60 gallons of water will suffice for an acre.

See to it that you do not spray the same area twice, for it may damage the crop.

TAKE THE FOLLOWING PRECAUTIONS

1. Do not spray 2,4-D on a wheat crop which is sown mixed with some 2,4-D sensitive crop (broad-leaved) like gram, oilseeds and linseed.

Narrow leaved crops like rice, wheat, oats, barley, maize, *jowar*, *bajra*, ragi and sugarcane are not affected by 2,4-D, when sprayed with a proper dose and at proper stages of growth.

2. See that drift from spray does not fall on sensitive crops in the adjoining fields. For this:

(a) Spray on a calm day when there is no breeze.

(b) Use a thick spray and lower the spray nozzle to about a foot above the ground if there is a sensitive crop within ten feet.

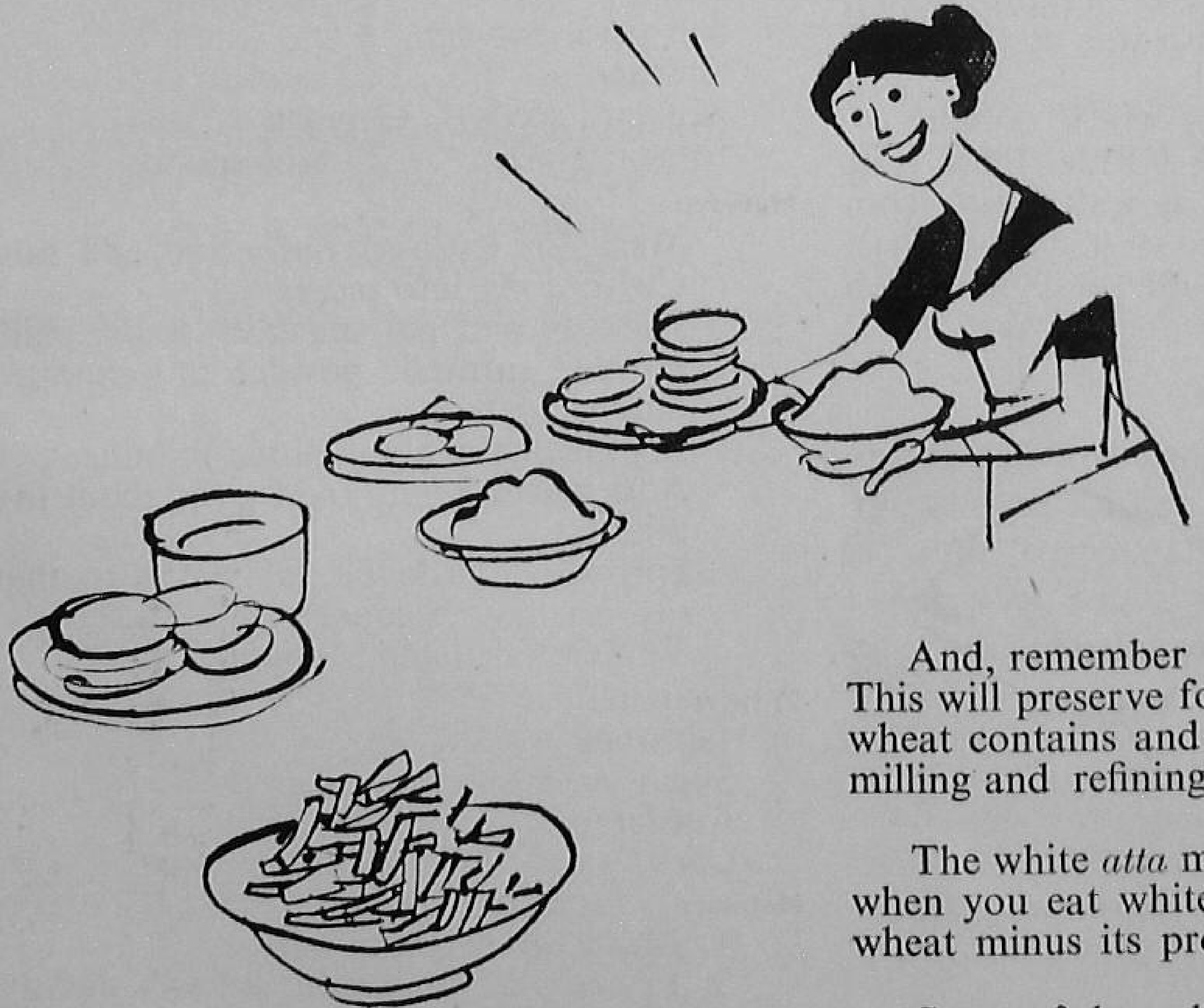
(c) Use a cloth screen between the crop being sprayed and the sensitive crop. A *dhoti* can serve the purpose well. But wash it after spraying. Get also the clothes worn by workers washed at the end of the operation.

It takes about 10 to 14 days for the weeds to die. It may even take more time if the temperature is very low.

The first sign of 2,4-D effect is the curling and twisting of the growing points of plants, within two to three days of spraying. If you find these signs, you can be sure that 2,4-D has been effective.

Try 2,4-D, in your wheat field and you will agree that it is the best weed-killer.

GIVE YOURSELF A TREAT WITH WHEAT



DON'T be satisfied with just making *chapaties* from wheat day after day.

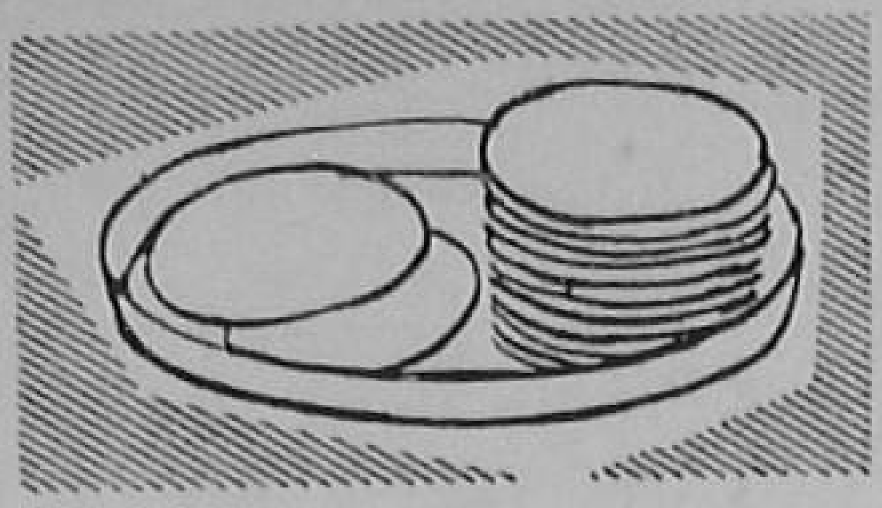
There are other tasty dishes you can prepare from wheat. Easily prepared, they will add to the variety, and also be nourishing for the family.

And, remember to use whole wheat *atta*. This will preserve for you all the food values wheat contains and which is removed in the milling and refining of the grain.

The white *atta* may look good to you, but when you eat white *atta*, you will be eating wheat minus its protein.

Some of these dishes, as you will see, you can prepare with whole wheat grain or its flour. Hence, the dishes are richer in food value.

BISCUIT ROTI



Ingredients :

Wheat flour	2 ounces
Ginger	¼ *chhatack*
Green chillies	20
Curry leaves	10
Besan to mix	
Salt to taste	
Ghee or oil for frying	
Freshly-grated half coconut	

Method :

Knead wheat flour to make a dough (as in *puries*).
Chop ginger, chillies and curry leaves very finely.
Mix the grated coconut and salt, and bind it together with *besan* (grain flour).
Make small balls with this mixture and keep aside.
Make small balls of wheat dough.
Roll the wheat ball a little. Place it in centre, and cover it up with dough from the sides (just as for stuffed *chapatti*).
Now roll out the stuffed *puri* and deep fry in *ghee* or oil.

HALWA

Ingredients :

Atta	3 ounces
Gram	1 ounce
Milk	4 ounces
Jaggery	2 ounces
Water	2 pounds

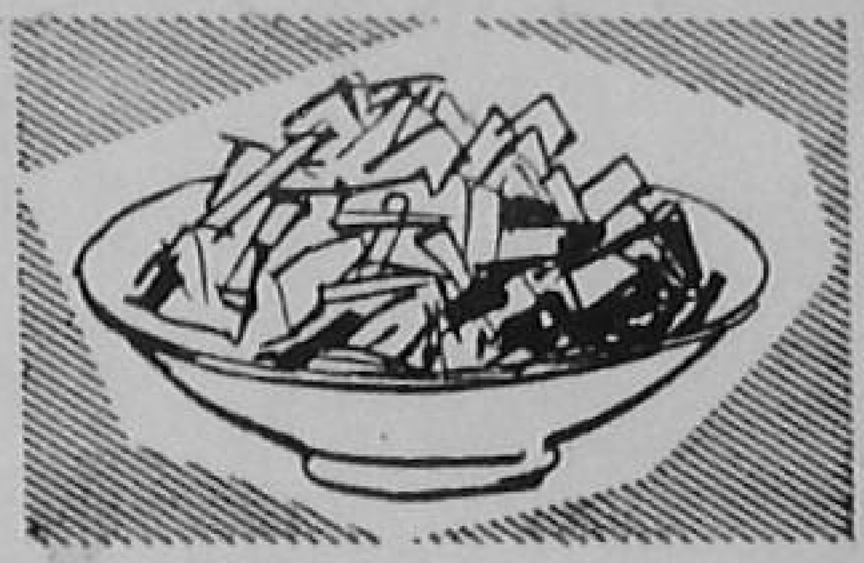
Method :

Clean, pick and wash gram.
Soak it for two hours.
Remove the husk and grind it.
Roast *atta* in an aluminium vessel.
Add the ground gram to 1½ pounds of water and stir it for some time.
Melt the jaggery with half a pound of water, strain it and add it to the above mixture by stirring.
When the mixture becomes thick, remove it from the fire and add hot milk.

Note: Instead of jaggery and milk, you can also use salt and curd.

CHURMA FROM LEFT-OVER ROTIS

You can prepare it in three ways : *namkin* (saltish), sweet, and in milk.



1) Ingredients :

Left-over *rotis*	8 medium size
Salt to taste	
Chilli powder	½ teaspoon
Turmeric powder	¼ ,,
Onions	4 small
Mustard seeds	a pinch
Mustard oil	2 tablespoons

Method :

Mash the left-over *roties* and add salt.
Cut onions into pieces.
Heat oil and put mustard seeds, chilli powder, turmeric powder and chopped onions.
Fry them for about three minutes.
Add mashed *rotis* and fry for about five minutes.
Sprinkle a little bit of water so that *churma* may become soft.
You can also add coriander leaves.

2) Ingredients :

Left-over *rotis*	8
Sugar or jaggery	¼ seer
Cardamons	4
Ghee	2 tablespoons

Method :

1. Mash the left-over *rotis*.
2. Fry *churma* in *ghee* till it turns slightly brown.
3. Add sugar and fry for a while.
4. Peel and grind the cardamom and add it in *churma*; take it off from the fire.

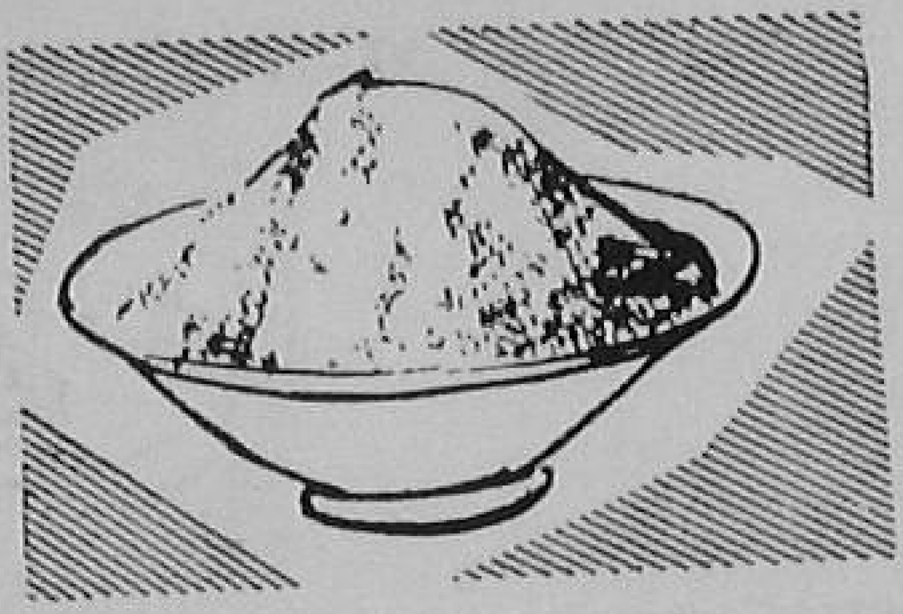
3) **Ingredients :**

Left-over *rotis*	8
Milk	$\frac{1}{4}$ seer
Sugar	$\frac{1}{4}$ seer
Cardamoms	4

Method :

1. Mash the left-over *rotis*.
2. Add milk, sugar and ground cardamoms.

WHEAT HOTCH-POTCH



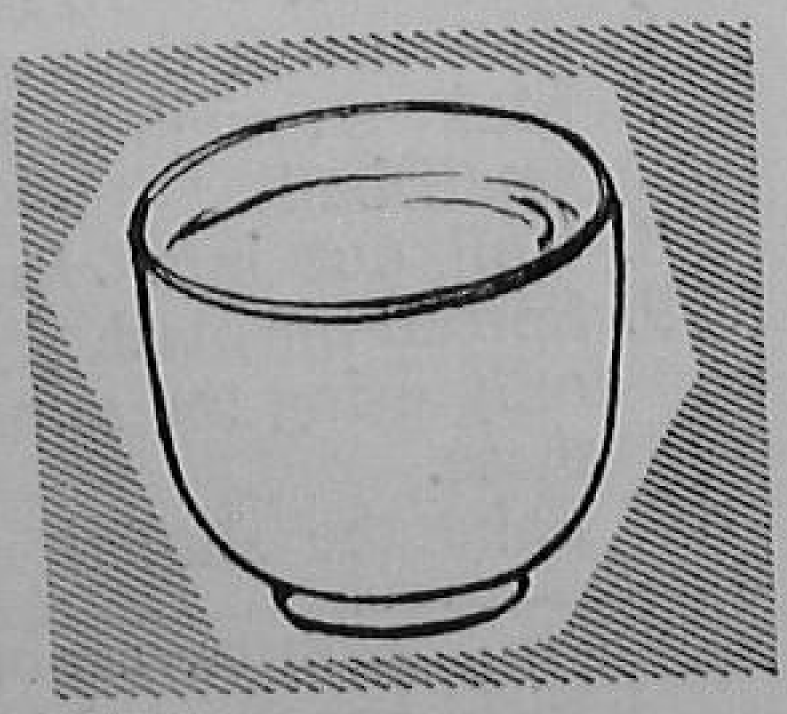
Ingredients :

Cracked wheat	4 tablespoons
Water	8 tablespoons
Green chillies	2
Ginger	a small piece
Coriander	$\frac{1}{2}$ teaspoon
Salt	1 teaspoon
Potato	1 small
Oil	1 tablespoon

Method :

1. Grind the green spices and roast in oil.
2. Wash, peel and dice potatoes in small cubes; add to roasted spices and stir.
3. After two minutes, add wheat and stir.
4. Add water and let the mixture cook for 20 minutes on a slow fire. Serve hot.

WHEAT PORRIDGE



Ingredients :

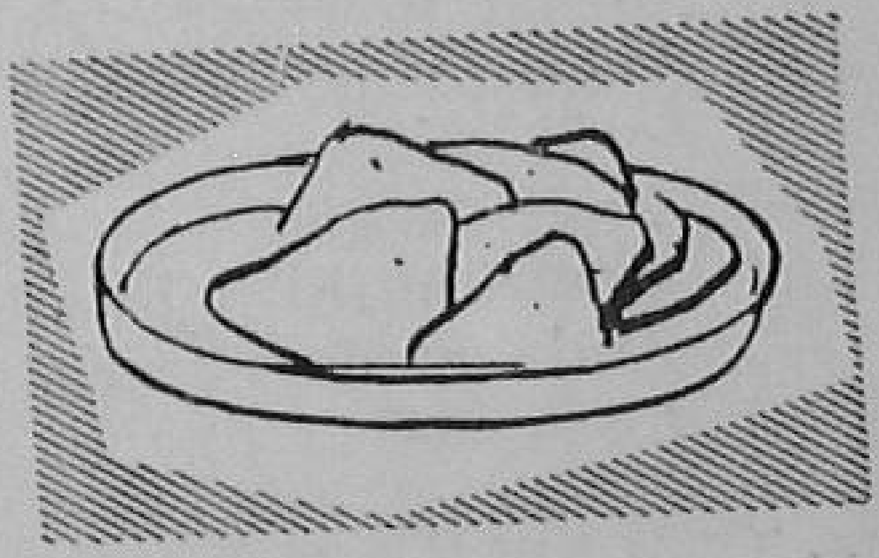
Cracked wheat	2 ounces
Sugar	2 ounces
Fat	1 teaspoon
Water	12 ounces

Method :

1. Roast wheat in a teaspoon of hot fat in a pan. Remove the roasted wheat from the pan.
2. Warm about 12 ounces of water in the same pan. Add roasted wheat to it and keep stirring for a while.
3. Let it cook. Cover the pan with a lid, and stir at short intervals.
4. When it is quite thick, add sugar. Let it stand on fire for another five minutes.
5. Remove the pan from the fire and serve hot.

It will take only 15 minutes to prepare the porridge.

CRACKED WHEAT PATTIES



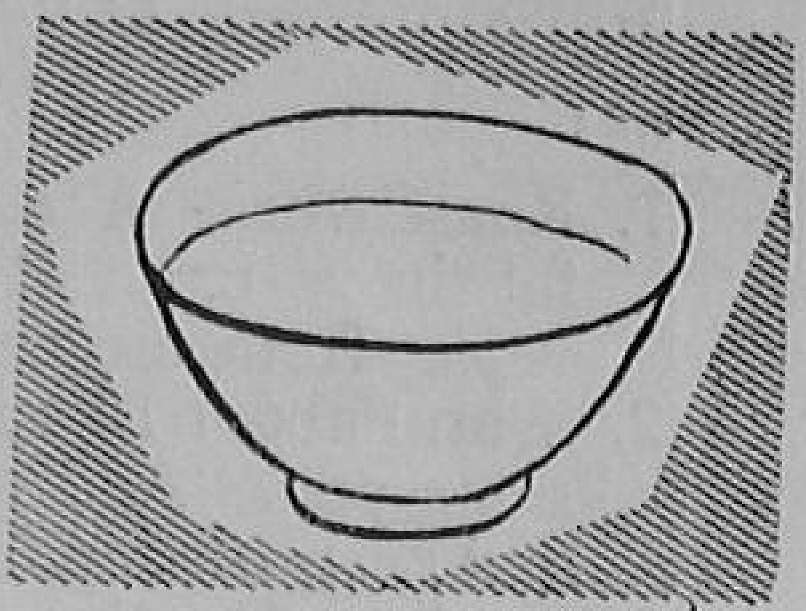
Ingredients :

Cracked wheat	2 tablespoons
Green chillies	2
Coconut	$\frac{1}{2}$ tablespoon
Salt	1 tablespoon
Turmeric	$\frac{1}{4}$ tablespoon
Potatoes	$\frac{1}{2}$ pound
Oil	$\frac{1}{4}$ pound
Ginger	a small piece

Method :

Roast wheat in one teaspoon of fat.
Add water and spices to the roasted wheat and cook on a slow fire for 20 minutes.
Remove from fire.
Boil, peel and mash potatoes.
Add salt to the mashed potatoes.
Take a small ball of mashed potatoes at a time, make into a cup, and fill it up with the wheat mixture.
Cover with mashed potatoes and flatten.
Fry in fat using shallow frying method until golden brown.
Serve hot.

WHEAT AND RAGI PORRIDGE



Ingredients :

Wheat (whole)	2/3 cup
Ragi (whole)	1/2 cup
Milk	1 cup
Gur	to taste
Cardamom (small)	1 or 2

Method :

Pick, clean, wash and steep wheat and ragi grains separately in water overnight.

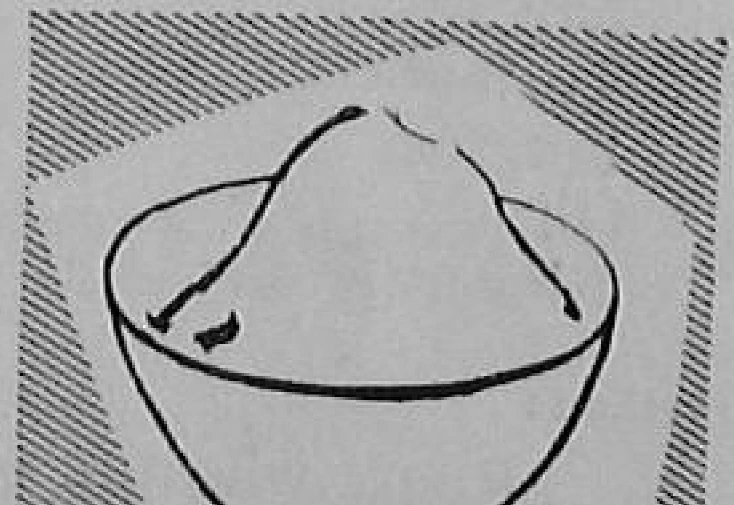
In the morning, grind them and then mix them together.

Add milk and about three cups of water to the mixture and cook on a slow fire till it is well cooked.

Add crushed cardamoms and *gur*. Cook for a few more minutes.

Serve hot for breakfast. This is a nourishing dish for children and can be easily digested.

WHEAT AND RAGI HALWA



Ingredients :

Wheat (Whole)	2/3 cup
Ragi (Whole)	1/3 cup
Milk	1 cup
Ghee	1 tablespoon
Gur	to taste
Cardamom (small)	1 or 2

Method :

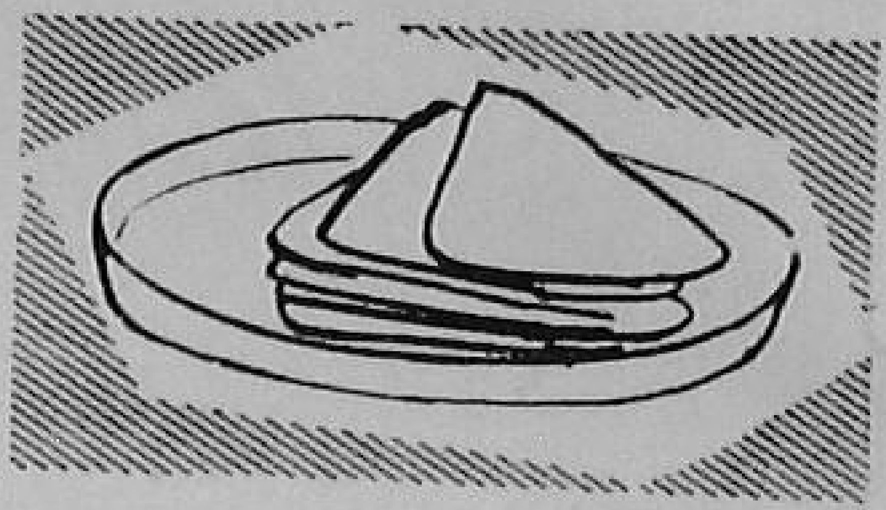
Clean, pick, wash and steep wheat and ragi grains separately in water overnight.

In the morning strain the water and grind the soaked grains to a fine paste. Heat *ghee* in a *karahi*. Add the ground wheat and ragi and fry on a slow fire till light pink in colour.

Add milk, *gur* and opened out cardamoms.

Continue cooking on a slow fire, stirring all the time, till the milk has dried up. Serve hot; or set on a metal plate greased with an edible oil. Cut into pieces when set. Serve with breakfast or tea.

STUFFED CHAPATI



Ingredients

Atta	1 ounce
Ragi flour	1 ounce
Salt	1/8 teaspoon
Water	
Any green vegetable like spinach	4 ounces
Oil	1 teaspoon
Onion	3/4 ounce

Method :

1. Wash the *saag* (spinaeh) but do not cut before cooking.
2. Peel and cut the onions into small pieces.
3. Fry them in oil till they are golden brown.
4. Add $\frac{1}{4}$ cup of water and salt.
5. When the water is boiling, cook the *saag* in it for 10 minutes.
6. Then mash the *saag*.
7. Make a dough with *atta* and form four small balls.
8. Roll out into *chapatis*.
9. Spread the mashed *saag* on two *chapatis* only using the remaining two to cover these.
10. Bake the stuffed *roti* on a *tawa*.

ACKNOWLEDGEMENT

I wish to thank Mrs. I. Attavar and Mrs. L. Rao for their contribution towards the recipes given in this article.

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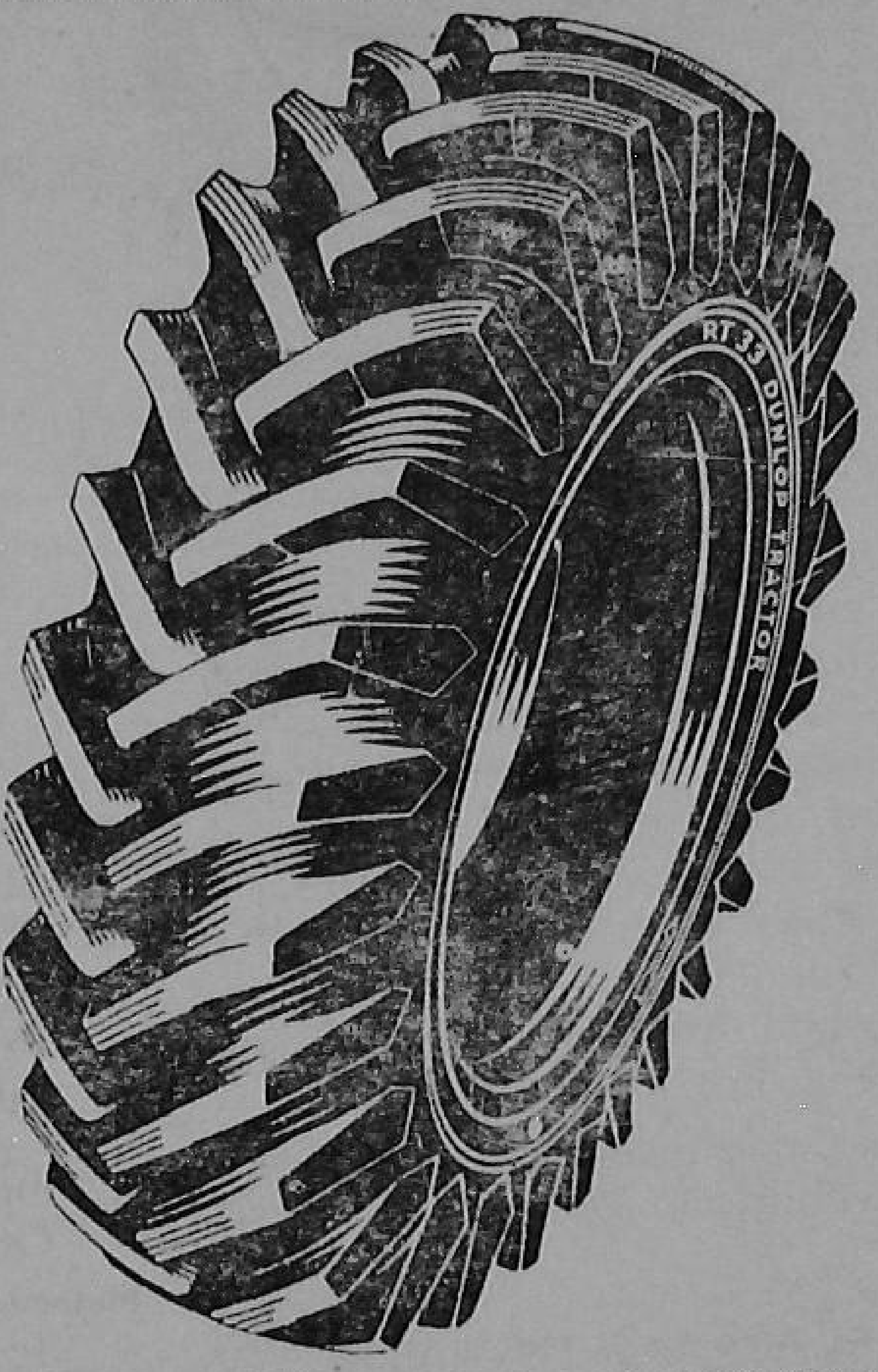

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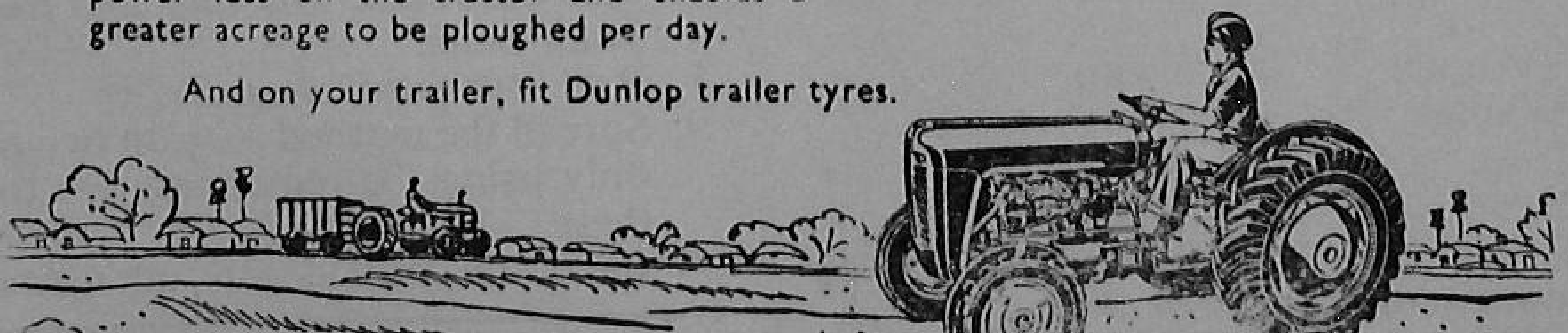

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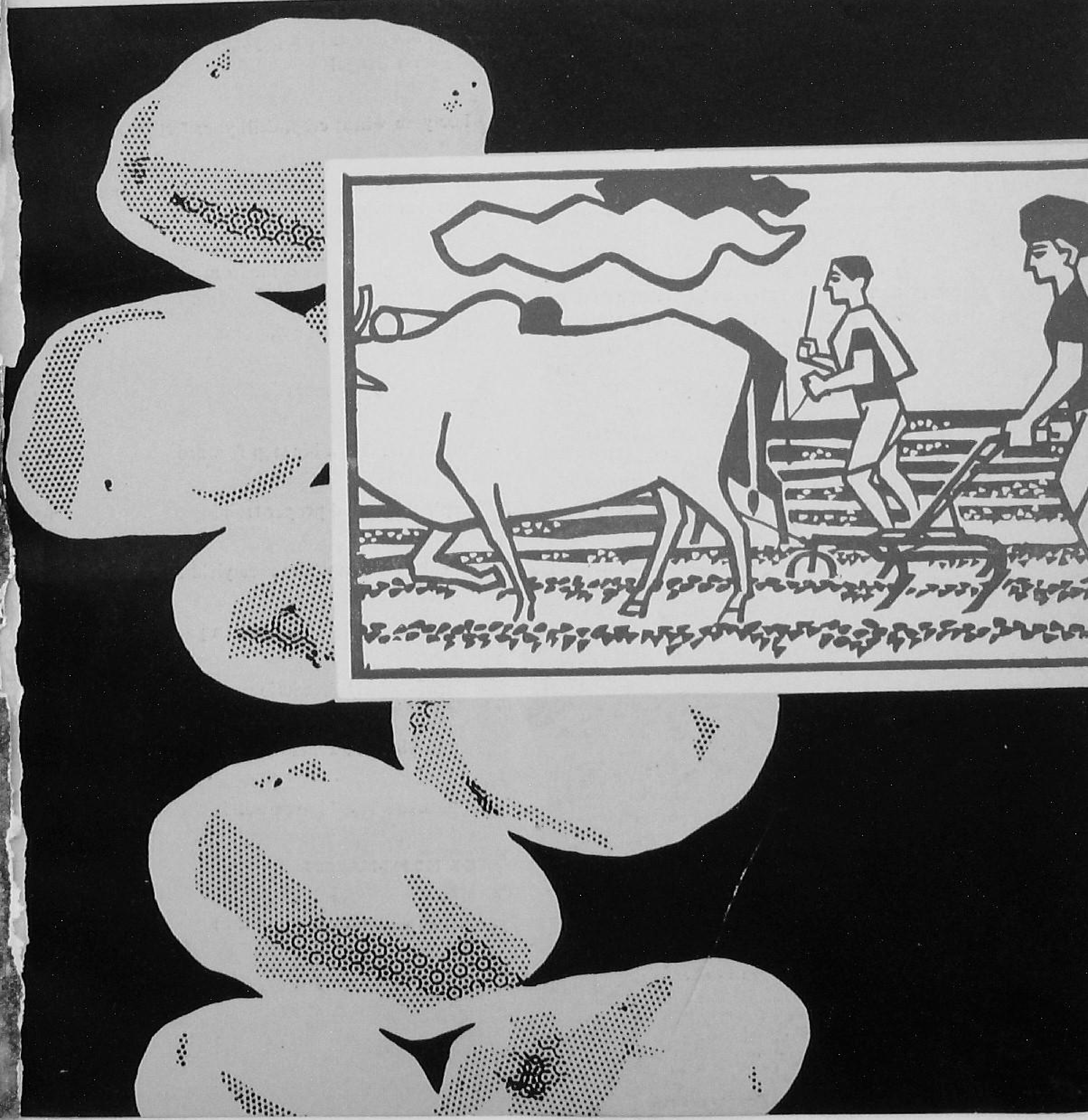

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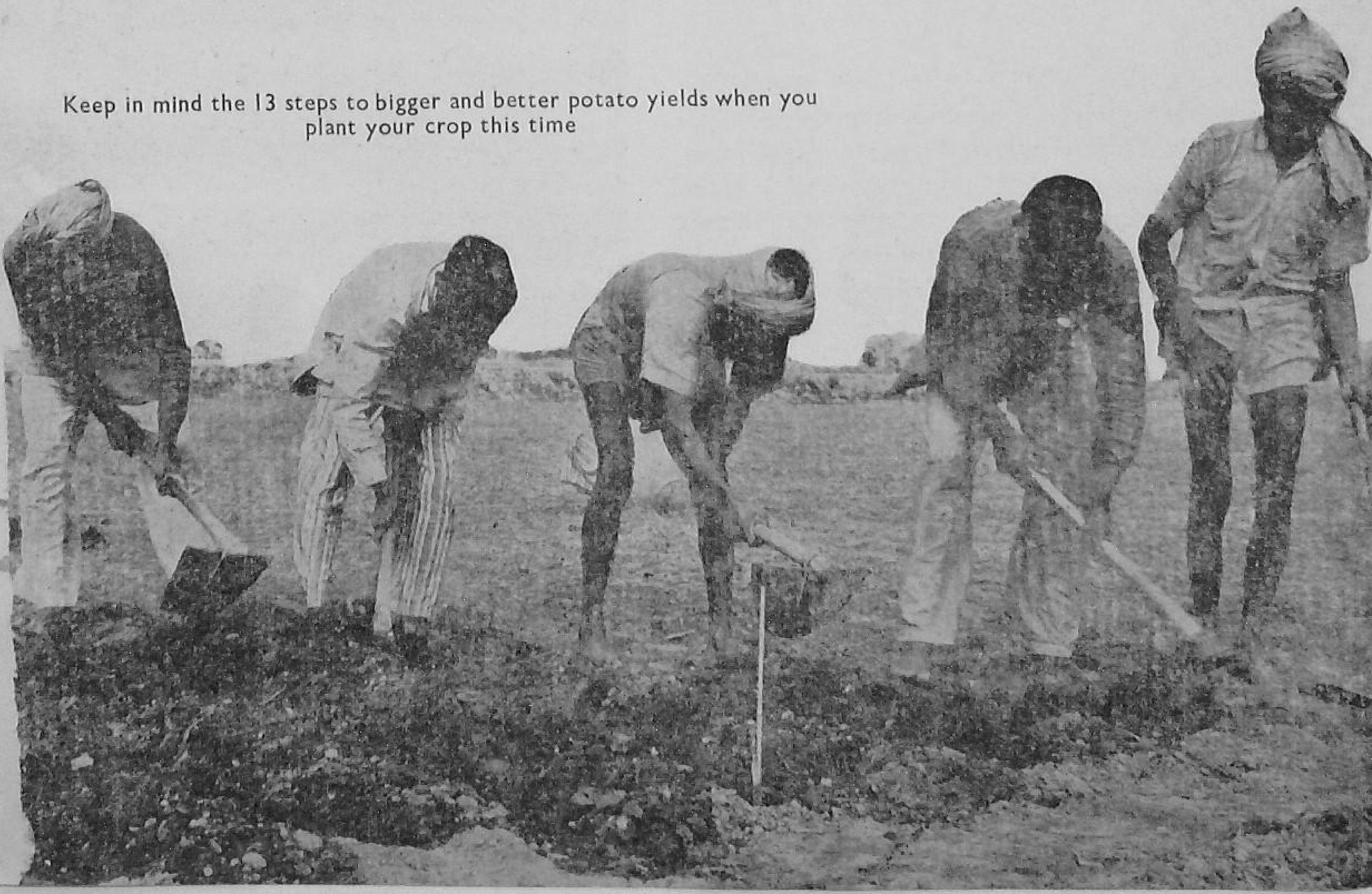
By PUSKARNATH and L. C. SIKKA

THE average yield of potato in India is only 80 maunds an acre. In advanced countries, it is as high as 220 to 300 maunds. These high yields are mainly due to the improved agricultural practices they follow. By adopting the following practices our farmers too can get equally high or even higher yields.

1. *Select a suitable soil for potato.* Although potato can be grown on all types of soil, it comes up best on well-drained sandy loam soils which are rich in humus.

Here is how POTATO YIELDS can be raised high

Keep in mind the 13 steps to bigger and better potato yields when you plant your crop this time



2. *Make sure, there is enough moisture in the soil before planting the seed.* The present practice is to plant the seed-pieces and irrigate the field thereafter. While doing so, the ridges get submerged. This results in a slower germination and rottage of the seed-tuber. So, the field becomes gappy. It has been found by experiments that an irrigation before planting (*rouni* irrigation), especially in the early crop, increases germination by 13 per cent.

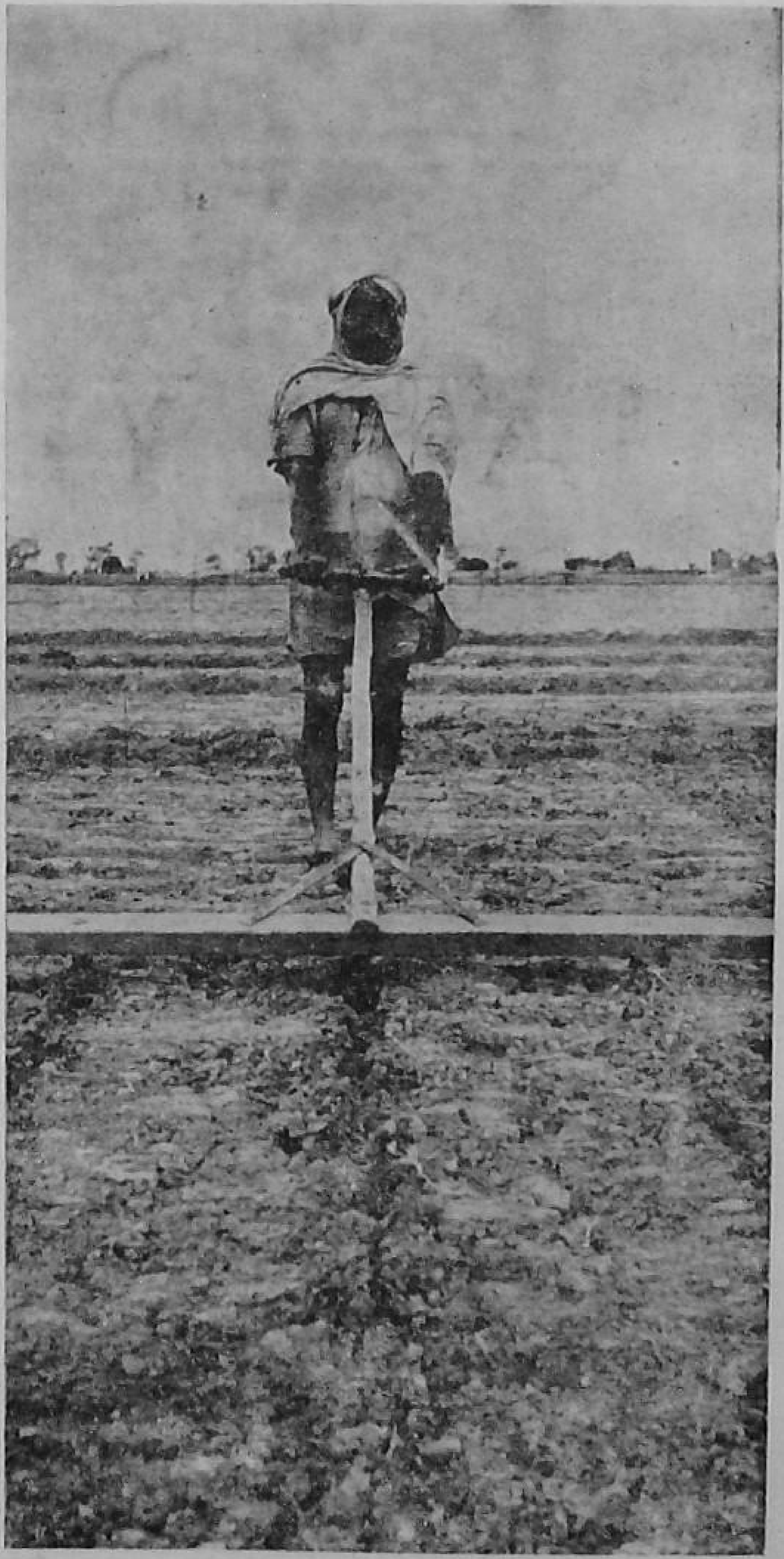
3. *Plant potato in time.* The proper season for growing potato is between October and March in the plains. So, begin planting for the early crop only at the end of September.

If you plant earlier, the stand will be poor. Some farmers plant as much as 40 maunds of seed to overcome this defect. This is unnecessary and costly. Plant in the first fortnight of October for the main crop and at any time during the first three weeks of January for the spring crop.

4. *Apply sufficient manures and fertilizers.* If your soil is a sandy loam, apply 400 maunds (15 cartloads or 4 truckloads) of farmyard manure or town compost, two to three weeks before planting. Better still, green manure the fields with sannhemp and apply groundnut cake. This will give you more yield and more profit. It is not enough if you apply only these organic manures. Potato requires nitrogen and responds to it highly. Apply 100 pounds of nitrogen (about 6 maunds of ammonium sulphate or calcium ammonium nitrate) to get optimum yields. Such application has been found to give 80 maunds or more tubers per acre.

Potato also responds to superphosphate and sulphate of potash. So, it will pay you to apply, along with 6 maunds of ammonium sulphate, $3\frac{1}{2}$ maunds of single superphosphate and $2\frac{1}{2}$ maunds of sulphate of potash. If you do so, your crop will be healthy ; the tubers will be bigger with firmer skin. Such tubers keep well in storage.

Draw shallow lines with a marker for planting potato at proper distances

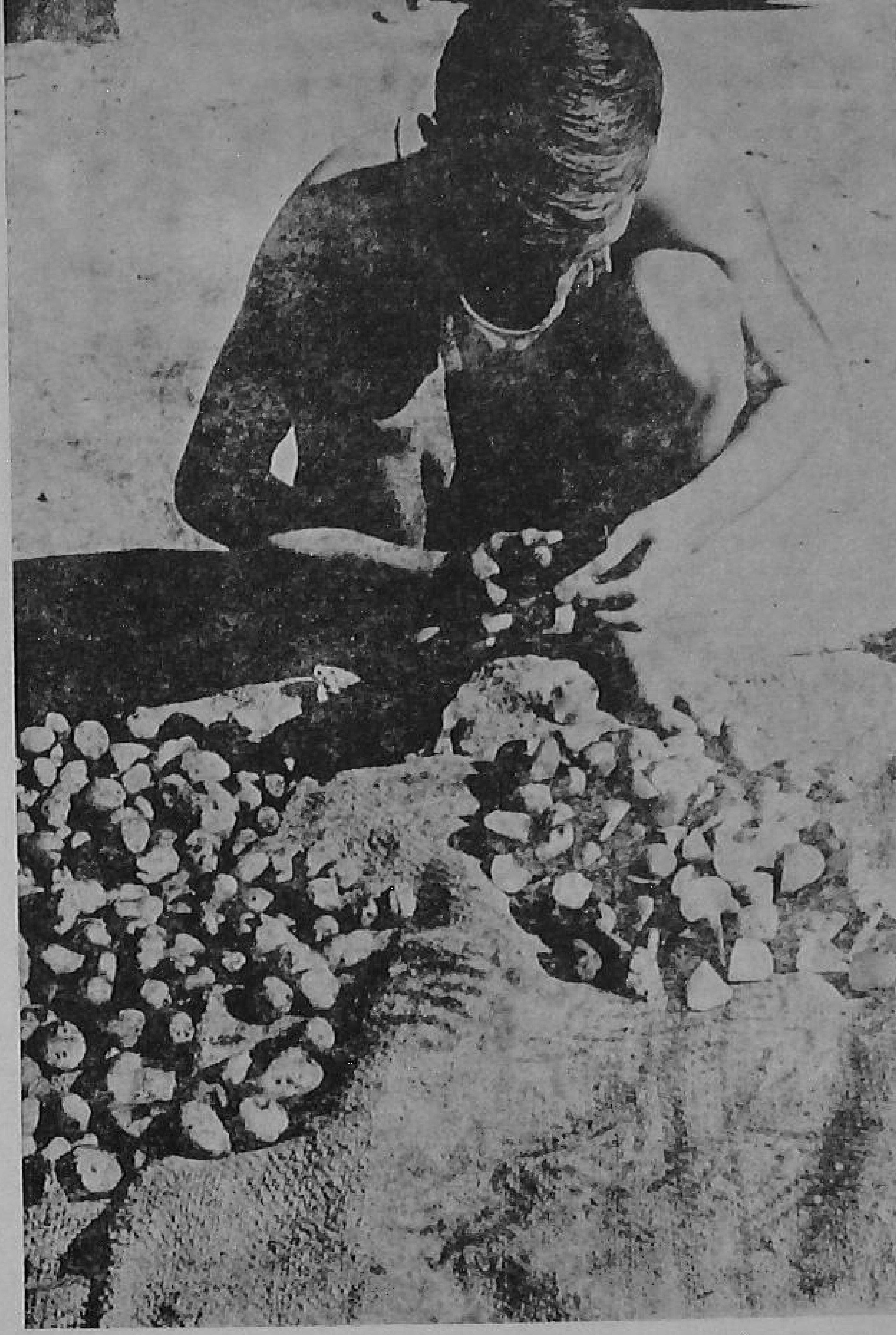


5. *Apply the fertilizers when they are most needed by the plants.* In the case of the early varieties, the crop puts on growth during the first 50 days, and during the first 75 days in the case of the late varieties. It is only after this period that the tubers begin to develop. If you apply fertilizers at the time of planting, your crop will get a good start, and put on the maximum growth which is necessary for the production of large-sized tubers.

6. *Place the fertilizers properly.* To get the full benefit from the costly fertilizers you apply, you should place them where the roots can reach them. So, apply the fertilizer-mixture in rows at a depth of three inches, that is, one inch below the seed-level. Cover the fertilizer with a one-inch deep layer of soil and then plant the seed. See that the seed-pieces do not come in contact with the fertilizer.

7. *Choose a suitable variety to suit your soil, and season.* You can choose from the following three good varieties: *Up-to-date*, *Craig's Defiance* and *Kufri Red*. The first two are early-maturing varieties and the third is a late one. *Up-to-date* matures in 3 to 3½ months. It has white, oval-shaped, large-sized, attractive tubers. It can be planted both as an early season and a main season crop. In trials, it has given a yield of 90 per cent more than *Military Special* (*Rangoon*). Some farmers feel that *Military Special* matures earlier than *Up-to-date*, because its leaves curl up earlier. This curling up of the leaves is due to a virus disease and not due to early maturity.

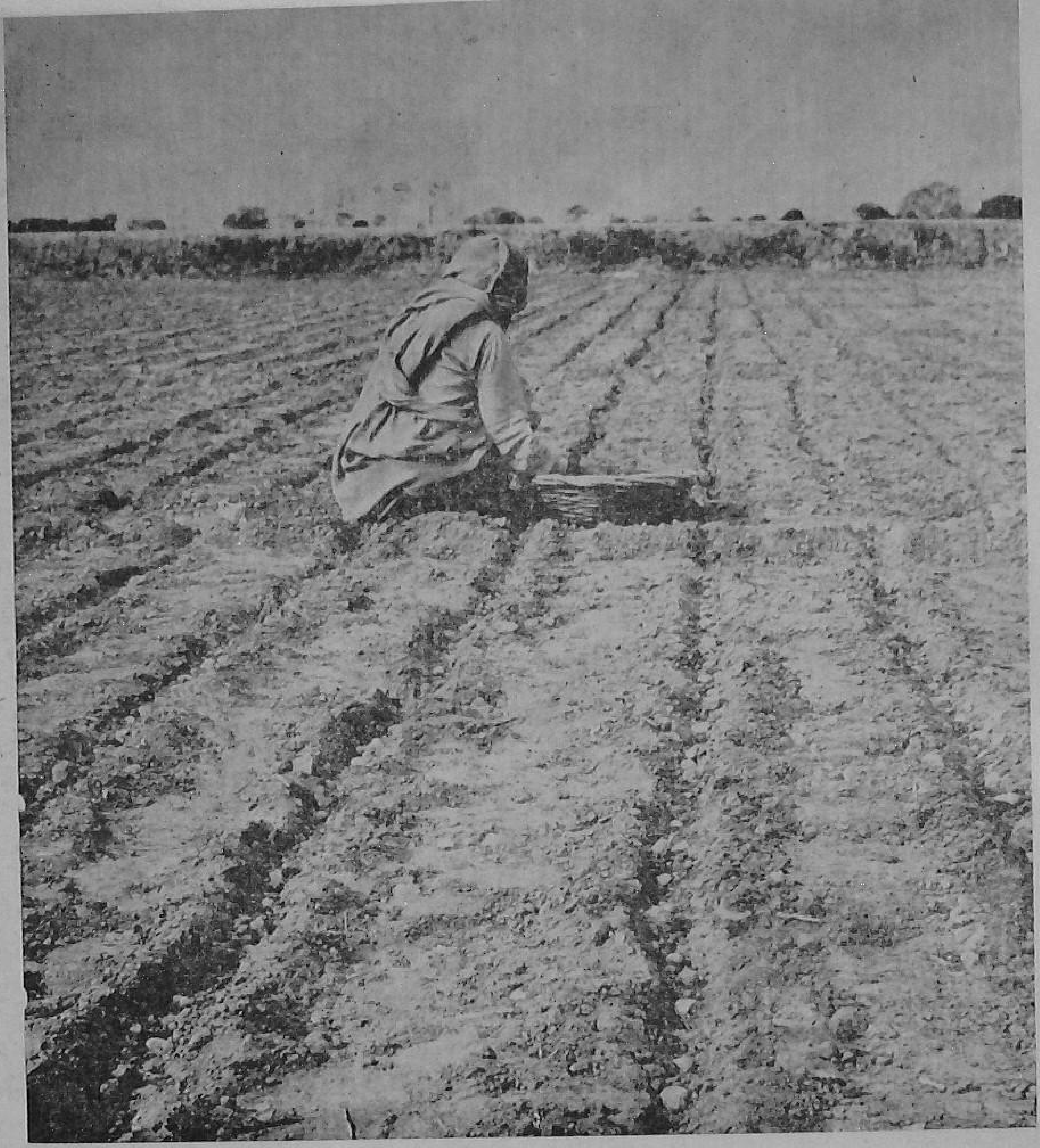
Craig's Defiance is also an early-maturing type. In fact, it is earlier than *Up-to-date* by 15 days, that is, it matures in 2½ to 3 months. Its tubers are white and large. It is best suited for planting in the main season or in the spring where temperatures are high. Do not plant it as an early crop.



Select good seed-tubers and cut them to a right size

Kufri Red is a late variety with reddish round tubers. It is best for growing as a main crop or for growing in lands where irrigation facilities are not adequate. It is a good substitute for *Darjeeling Red Round* which is infested with the serious wart disease.

8. *Plant good and healthy seed.* If you are not careful about your seed-stock, no amount of care or fertilizers will help you out later. A good potato seed should be pure, have good germination power, be free from



Apply the fertilizer-mixture in the rows, cover it with a one-inch layer of earth and then place the seed-pieces at proper distances

diseases, particularly virus and be in good physical condition.

To secure good seed,

- get your stock from a reliable merchant or a Government agency;
- renew periodically your seed-stock by obtaining fresh seed from high hills;
- avoid small-sized tubers for planting as they generally carry diseases;
- examine your seed-crop carefully once or twice during the growing season; remove and burn the virus-affected plants;
- produce your own virus-free seed. It is easy. The virus disease is carried by aphids or plant lice. These aphids are present in the plains between January and March. If there is a crop in the field during this period, aphids infest the leaves. So don't allow the plants to re-

main green after the first week of January. Kill all the haulms (shoots). Let the tubers remain in the ground till the middle of February when the cold stores start working. Transfer your seed to a cold store and use it for raising the next crop. If you do these things, your seed stock will remain free from virus for several years.

9. *Sprout the seed before planting.* Take the seed out from the cold store at least 10 days before planting. Keep it under a thatched shed or tree which gets indirect light, for 10 to 15 days. This will make the sprouts strong, thick and green. Such sprouts will emerge earlier and grow vigorously. This practice is specially helpful in the maturing for the early crop.

See for yourself how improved cultural practices help you reap a rich harvest like this one

10. *Adopt a suitable seed-rate.* For *Up-to-date*, plant 25 to 30 maunds of tuber per acre. For *Craig's Defiance* you may use 35 maunds. For small-tubered varieties like *Kufri Red*, 16 to 20 maunds are sufficient

11. *Plant the seed properly.* Experiments have shown that the Jullunder method of planting potatoes gives 12 to 30 per cent more yield than any other method. In this method you draw shallow rows by means of hand-drawn markers. Then spread the fertilizer-mixture uniformly in these rows and mix it with the soil with the help of twigs. Place the seed-pieces at proper distances and cover them with a layer of four to five inches of earth by means of *khurpas* or spades.

12. *Space the seed suitably.* To get the maximum yield of potato, the number of plants in an acre should not be less than 26 to 30 thousand. You can get this number if you keep a distance of $1\frac{1}{2}$ feet between the rows and 9 inches between the plants for the early varieties. For the late varieties, plant the tubers 9 inches apart in rows spaced $1\frac{3}{4}$ feet from one another. By adopting these spacings you can increase your yield by 10 per cent.

13. *Lastly, irrigate with care.* Give the first irrigation after sprouting has begun. Later, irrigate at intervals of 7 to 10 days. Avoid heavy irrigations. Light but frequent irrigations help plants use the fertilizers better and give higher yields.

GROUNDNUT will be a paying RABI CROP

By K. SEN GUPTA and M. K. DAS

So far, there has not been much of groundnut-growing in West Bengal. The crop today occupies but a thousand acres of the total of 13 million cultivated acres of the State. The reason for this small area is this: groundnut being cultivated generally under rainfed conditions in *kharif*, its sowing season coincides with that of other highland *kharif* crops. Moreover, it has not been possible for farmers with small holdings to grow groundnut in place of foodgrains.

It is now found that the farmers can grow groundnut with profit in the *rabi* season with the help of irrigations.

They can sow groundnut in October-November, even up to January. When sown in October-November, they can harvest the crop in March-April. The January-sown groundnut is harvested in May.

Because groundnut can be sown from October to January, it is possible to fit it in

different crop rotations. Here are a few crop rotations suitable for adoption:

Crop	*Date of sowing*	*Date of harvest*
1. *Jowar* and maize for fodder	Early June	July end
Aman paddy	Early August	December
Groundnut	January	May
2. Early *aus* paddy	May	July
Transplanted *aus* paddy	Early August	October
Groundnut	November	March-April
3. *Aus* paddy	June	September
Tori	October	December
Groundnut	January	May
4. Jute	April	July
Early winter vegetables like radish, spinach etc.	August	October
Groundnut	November	March

When the crop is sown in January, care has to be taken in harvesting it. If good showers are received in April-May or if too much water has been given at the later stage of the crop growth, the crop will look green even in May, though the seeds would have matured. Hence, farmers should carefully see whether the pods are ripe or not and then harvest the crop.

After the nuts have been picked, the haulms can be put back into the soil. This will benefit the succeeding crop.

The following tips would be of use to the farmers when they start growing groundnut.

Select a well-drained light or medium soil.

Plough the land four to six times and about six inches deep. Remove the stubbles.

Apply 'Aldrex' at 20 pounds to the acre to control termites.

Apply compost at 2 to 5 tons per acre and superphosphate at 200 pounds per acre.

Select a good variety like *TMV 2* or *NG 70*. You will need 40 to 100 pounds of seeds per acre, depending upon the variety and the spacing adopted.

Sow in rows 10 to 12 inches apart, depending on the variety, and 6 inches between plants.

Apply a light dose of ammonium sulphate to help the crop get a good start.

Hoe twice or thrice before flowering.

Give an irrigation, two or three days after sowing, to help seeds germinate. Irrigate a few more times during the growing period. Before harvest give an irrigation if the soil is stiff.

Spray the crop with 4 to 5 pounds of 'Fytolan' mixed in 100 gallons of water per acre along with 50 per cent wettable powder DDT, at an interval of 20 to 30 days, starting from a month after seeds have germinated. This will keep the crop free of diseases and pests.

With this much attention paid to the crop, farmers should be able to get a yield of 20 maunds of groundnut per acre.

For your wheat crop

Drill The Fertilizer —Don't Broadcast It

By DHYAN SARUP

WHEAT profits can surely go up if you drill the fertilizer instead of broadcasting it.

Every cultivator can practise drilling of fertilizer without any extra expenditure. Drilling of fertilizer can be done with the help of a *pora*.

The village blacksmith can construct a *pora* very easily. It is not very complicated implement. It consists of a tube of 1½-inch to 2-inch in diameter, and on the upper end of the tube a funnel is attached. The *pora* can be either made of tin sheet or of bamboo. Attach its handle behind the country plough and work.

You will need to employ one man and a woman if you sow wheat by this method. The man will handle the plough with one hand and with the other he will feed the *pora* with the fertilizer. The woman will sow the wheat seed behind the plough by *kara* method.

When you broadcast fertilizer, it is spread throughout the field and wheat plants cannot utilize the full dose of fertilizer as some of it is lost to weeds. Moreover, the fertilizer which remains between the rows helps in the growth of weeds.

But if you drill the fertilizer, plants will be able to utilize the full amount of the fertilizer you apply ; because while drilling, the fertilizer will be placed two to three inches below the seed-level. As the roots come out they will at once utilize the fertilizer.

Plants thus are able to grow better, yield high and produce seed of good quality.

At my own farm I have seen that where I broadcast the fertilizer I got 15 maunds of wheat per acre and where I drilled the fertilizer, I got 23 maunds of wheat to an acre.

TO OUR SUBSCRIBERS

The recent power shortage in Delhi resulted in the dislocation of the printing of our journals. That is why the September issue of EXTENSION reached you late.

In our effort to make available to you the timely information you would want to have, we have published this as a combined issue for October and November, 1962. The future issues will be sent to you well in time.

Subscribers will as usual receive 12 issues for their annual subscription. The subscription period of all subscribers who are currently on our mailing list is being extended by one month. The inconvenience caused is regretted.

Business Manager
Farm Information Unit
Directorate of Extension
Krishi Bhavan, New Delhi

WHAT YOU SHOULD KNOW ABOUT CALCIUM AMMONIUM NITRATE

By A. K. DUTT

CALCIUM ammonium nitrate (also called CAN) is a nitrogenous fertilizer like ammonium sulphate, urea, ammonium sulphate nitrate and ammonium chloride.

CAN, like ammonium sulphate, contains 20 per cent of nitrogen. Moreover, it also contains calcium (lime). While ammonium sulphate when applied makes your soil acidic, CAN produces no such bad effect. Because CAN contains lime, it is very useful for applying to acidic soils. On certain types of soils, which cause sulphide injury to crops, calcium ammonium nitrate works better than ammonium sulphate.

Calcium ammonium nitrate absorbs moisture from the air. To prevent the fertilizer from absorbing the moisture and thereby caking, it is made available to you in a specially coated pellet form.

A GOOD FERTILIZER

Calcium ammonium nitrate is as good as ammonium sulphate or urea or ammonium sulphate nitrate. It can be used on a wide range of soils, and like ammonium sulphate it can be applied both as a basal and top-dressing. However, to get the best results from this fertilizer, you must know when and how to apply it.

WHEN AND HOW TO APPLY

Apply calcium ammonium nitrate to the wetland paddy (rainfed and irrigated) as a top-dressing. Do not apply this fertilizer to the field at puddling time. If you do, a part of the nitrogen will be lost. It is better to apply it in two or three doses, instead of applying all of it at a time. This way, plants will get the nitrogen at the time they need it most. If the leaves of the crop are moist, mix dry sand or soil with the fertilizer before top-dressing. If yours is an irrigated paddy and you have control over irrigation, better drain out the field first. Apply the fertilizer and mix it with the soil, and irrigate immediately.

If you do not have any control over irrigation, apply CAN to the standing crop, as you do for a rainfed crop, and mix it well with the soil.

Apply CAN as a basal dressing during the tillage operation, before sowing or transplanting, to the soil for dry-land paddy, wheat, cotton, sugarcane, tobacco and vegetables.

When you want to apply it to a moist soil, mix it with the soil thoroughly.

If, however, the soil is dry, as under the rainfed conditions, apply the fertilizer, *but do not mix it with the soil.*

When you apply the fertilizer to a dry soil before irrigation, avoid over-irrigation to get better results.

For the specific dose of the fertilizer to be used for your crops and for any other information on the use of this fertilizer, consult your Gram Sevak or Agriculture Officer.

CAN IT BE MIXED ?

You can mix calcium ammonium nitrate with other fertilizers, *but you cannot store the mixture* for future use. Mix with other fertilizers only just before applying in the field.

HOW TO STORE

This fertilizer comes to you in small polyethylene bags of 50 kilograms each having an outer gunny cover. Once you open the bag, you have to use all the fertilizer contained in the bag. If you need but only half of it, you can share the other half with your neighbour. If you, however, want to keep the rest of it for your future use, open the bag carefully at one end, remove the fertilizer you need and seal the bag by folding the inner polyethylene cover as many times as possible, and then store. This will prevent the fertilizer from absorbing moisture from the air and caking.

REMEMBER !

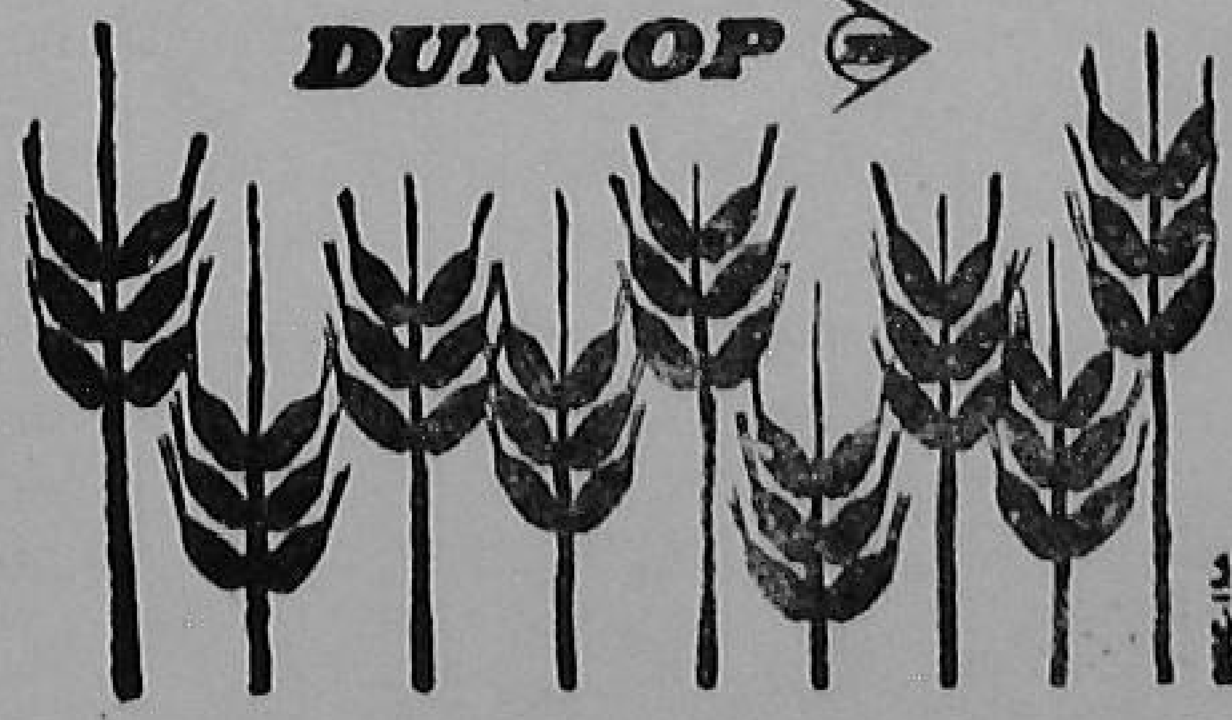
- Do not open a CAN bag until you need it for applying in the field.
- Do not forget to seal the bag carefully in case you have used only a part of the fertilizer.
- Do not allow the bags to come in contact with the damp or moist floor. Store the bags in a cool, dry place.
- Do not keep other extra weights on the bags.

This tyre lowers your farming costs

Tractor farming becomes easier with the Dunlop RT 33 open centre tractor tyre which has more tread bars to give the maximum grip on hard dry soils. This tyre reduces power loss on the tractor and enables a greater acreage to be ploughed per day.

More tractors in India are fitted with the Dunlop RT 33 Tyre than any other make

DUNLOP



BETTER CASHEW TREES COME FROM AIR-LAYERING

By V. N. MADHAVA RAO

WHY do some cashew trees yield over 200 pounds of nuts per year and others just a few pounds each ? And this happens in spite of the same care given to both !

There is a reason for this. Cashew is mostly grown from seed. The seed from even a very good-yielding tree need not produce a plant, which can give high yields like its mother plant.

To get plants with the same high-yielding quality, as that of the mother plant, farmers try such methods as layering, budding or grafting, or use cuttings. With these methods they produce plants which behave just as the mother plant does. The grower is thus able to multiply selected good types only. Trees raised by these methods also start bearing earlier than those raised from the seed trees.

Of all such methods tried, air-layering proved to be the best at the Cashew Research Station, Ullal, Mangalore (Mysore State). About 75 per cent of the air-layers grew into good seedlings.

This is how you can prepare air-layers.

- Select full-grown trees which produce a large quantity of big-sized nuts, and have started bearing early.
- Remove about 1/8th to 3/4 inch wide bark in the shape of a ring from the shoots which is pencil-thick or about a month to a year old.
- To prevent the cut portions from healing and joining together, tie a strand of coir fibre or twine over the same.
- Next, cover the treated portion with a rooting medium of moss, coir or wood shaving. Even sand will do.
- Wrap with a 5-inch by 6-inch piece of polythene film of 150 gauge ; secure the ends with twine. Such a wrapper will keep moisture for a long period and allow exchange of gases in the plant tissues. This way, the treated portion along with the rooting medium will always keep moist. It will not need watering later on.

In about 20 days, the cut ends will show a swelling. At the end of two months, roots will start coming out from the shoots. You will notice clusters of reddish brown roots with pinkish white pointed ends at the upper

edge of the ring-like cut, some of them piercing through the transparant film. These can be seen in another 20 days.

When this happens, the rooted shoot or the 'layer' is ready for separation from the parent plant. Don't separate the layers at once, but in two or three stages. After 75 days, give the first 'V' shape cut half way through the stem just an inch below the point of root growth. Give the second cut to deepen the first one a week later. After a few days, follow with the third or final cut to separate the layer from the mother plant. Where the rooting is heavy, you can separate in two stages.

Transfer the rooted layers in earthen pots or containers nine inches long and four inches in diameter in which you have put a mixture of red earth leaf mould in equal proportions. Take care to avoid injury to the root while transfering

You have to water the layers regularly during the non-rainy periods and in summers. Plant out the layers in the field during the the monsoon season—June-July, but not after July. You can plant out the layers directly in the field or after nursing them in the pots for some time.

You can prepare cashew layers any time in the year. But the periods from January to April and August to December are the best.

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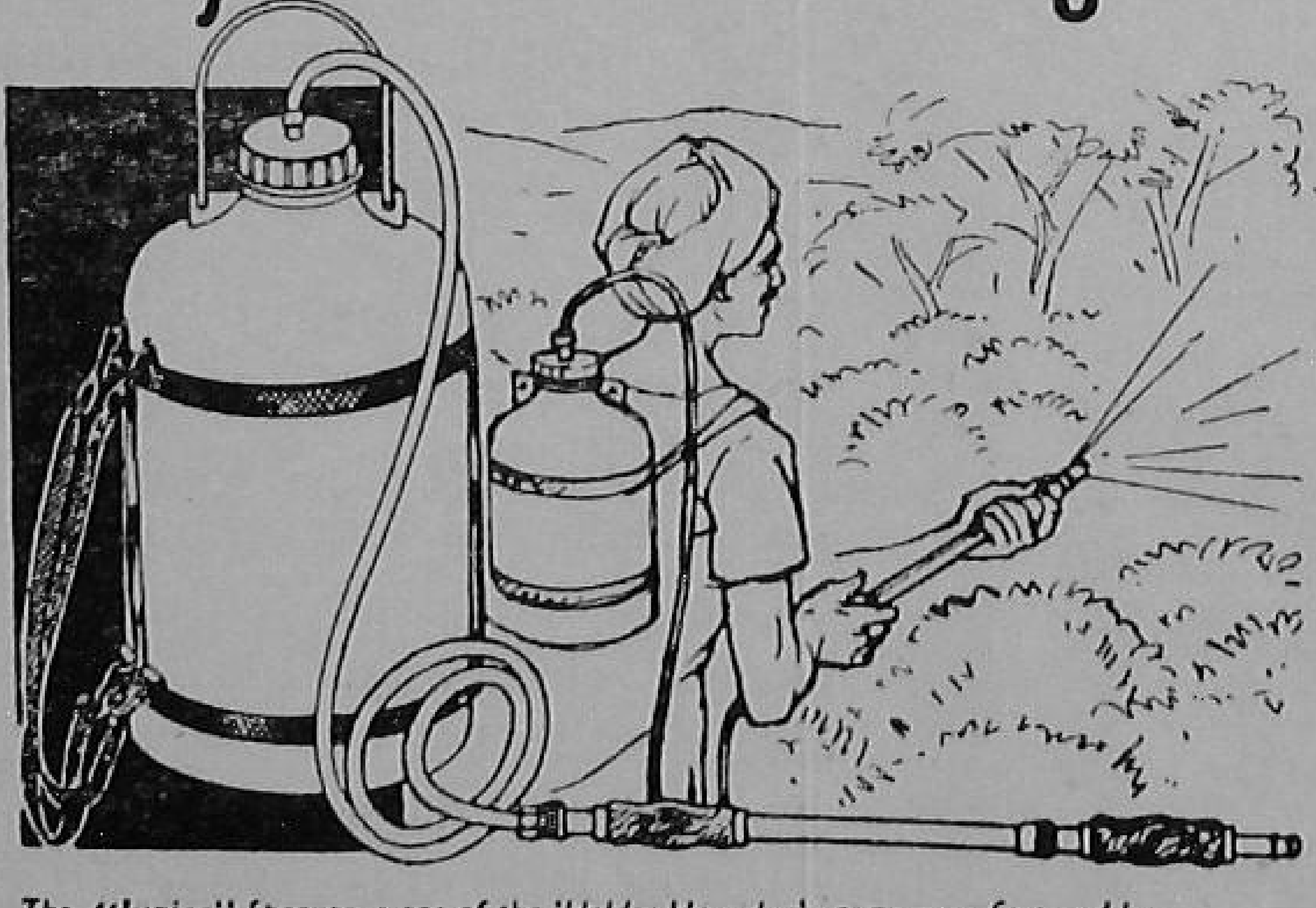
do you have four bighas land?



If you have four or more bighas of land to cultivate and protect from the ravages of pest . . . you will find the *'Holder Harriden'* **"Junior"** Sprayer indispensable.

This cheap continuous action, double-acting hand pump fitted with a 2-ft. Lance Extension, Angle Bend, 3 different nozzles, 4.5 ft. of hose and a 2 gallon light-weight (3 lbs.) plastic container, will soon pay for itself in the form of a healthy and bountiful crop.

The "Junior" Sprayer is one of the 'Holder Harriden' range manufactured by

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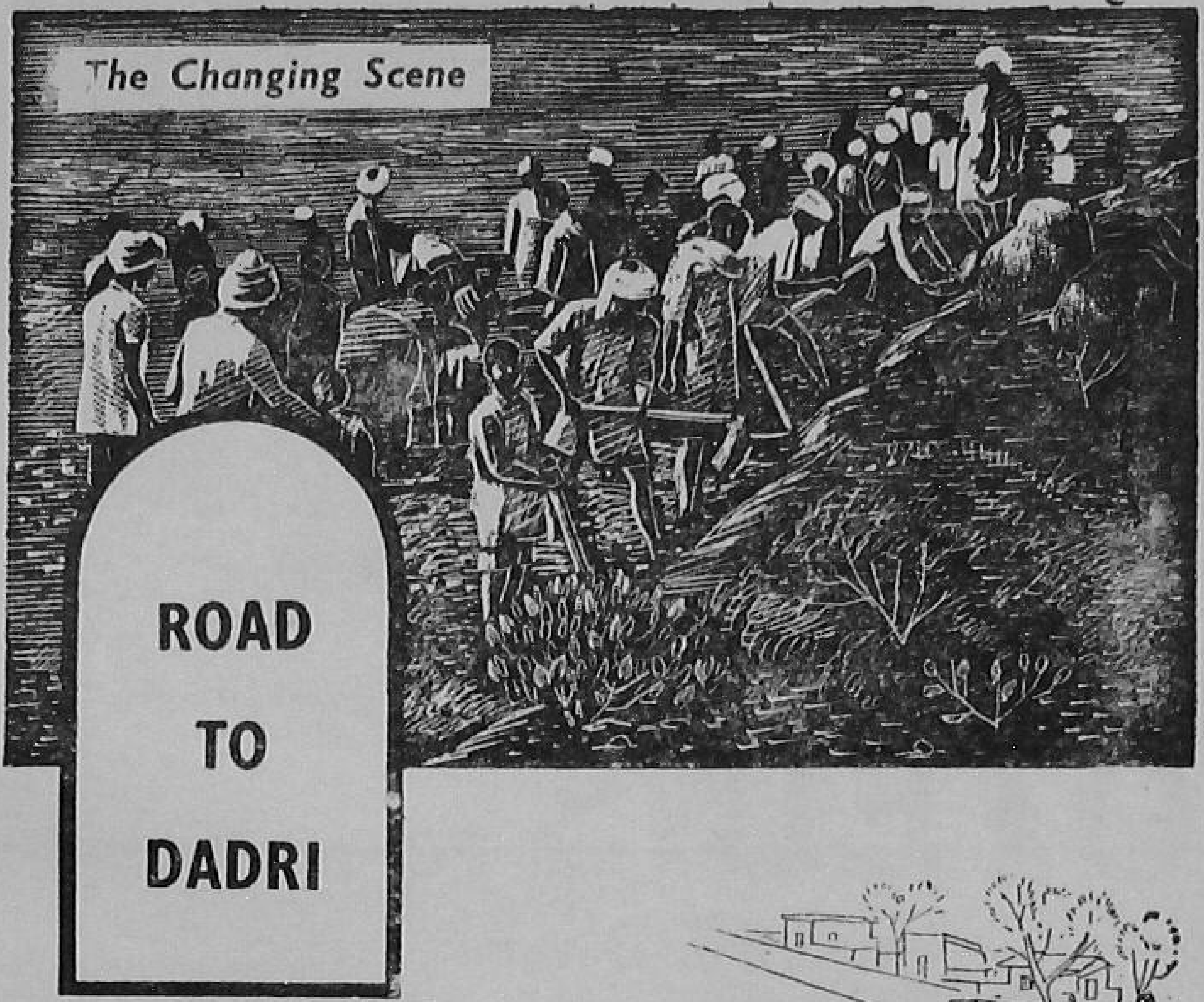
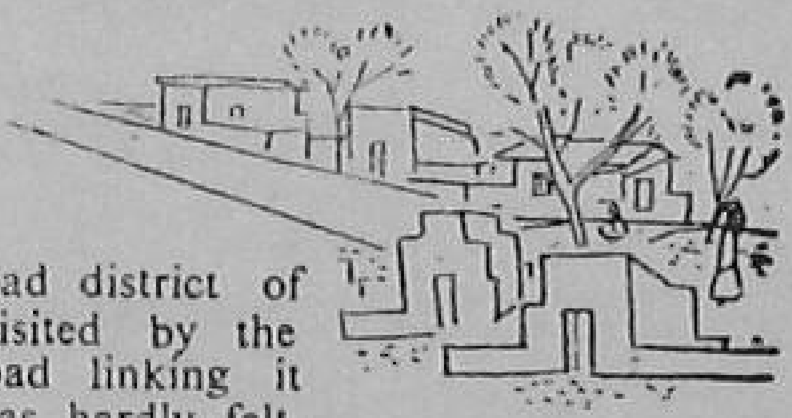
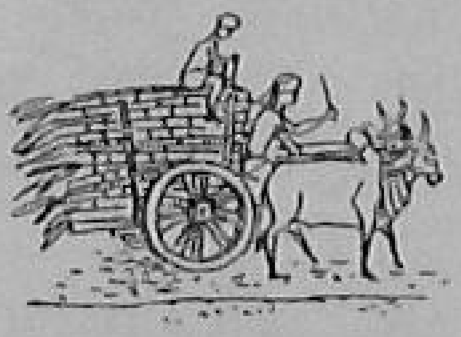




DADRI—a tiny village in the Allahabad district of Uttar Pradesh lived its usual life unvisited by the wheels of progress. There was no road linking it to the world outside and the need was hardly felt.



But then started the great change. Like thousands of villages Dadri too woke to the message of planned progress. The farmers put in extra effort, the land responded to better cultivation and yielded more and more sugarcane. To transport sugarcane to the factory the village now needed a road.

The enterprising villagers of Dadri put their heads together and decided to draw the shortest line to the nearest pucca road and wherever the line passed the owner contributed land as a gift and thus the road was laid. **This was an expression of faith in the movement for development and the promise of a brighter future for everyone.**

Road building is changing the face of rural India, bringing it nearer to the highways of progress and prosperity. The mileage of unsurfaced roads rose from 1,51,000 miles to over 2,50,000 miles during the first decade of planning, while that of surfaced roads rose from 97,500 miles to 1,44,000 miles. During the Third Plan period, we hope to build another 25,000 miles of surfaced roads, apart from making considerable addition to the unsurfaced road mileage.

THIRD FIVE YEAR PLAN

A GOOD LIFE FOR EVERYONE

D.A. 62/408

FINDING
PROTEINS FOR VILLAGE BIRDS

By K. KANTHASOMI

EXPERTS say that chicks and growing birds need 20 per cent and layers 16 per cent of protein in their feed. Out of this, 25 to 30 per cent must be of animal origin.

Getting protein foods for poultry is a real problem, however, in villages.

The villager can of course select fish-meal, blood-meal, meat-meal, milk products or insects to supply his birds with the protein they need.

Excepting insects, the other feeds will be costly, as it is not easy to get them in the village. You can, however, always get insects without any difficulty.

White-ants and maggots among insects can provide the birds with the proteins they need. And this is how you can multiply white-ants and maggots.

WHITE-ANTS

Prepare dung cakes. Dry them in the sun. Put these in any mud pot. Sprinkle water inside.

Keep the pot upside down, so that there is shade inside. You will find a rich growth of white-ants. In case you don't find any, get some white-ants and put them in the pot. They will multiply very fast.

Feed these to your birds, but do not allow the birds to drink water after they have taken the feed.

MAGGOTS

Collect some ruminal contents, i.e., half-digested material from a slaughter house. Spread it under the shade. Sprinkle some water over it and cover it with sand.

Flies will go and lay eggs there. After some time, you will find a rich growth of maggots. But protect them from crows and other birds.

Feed maggots to your birds before putting the birds in the poultry-house in the evening. But again, do not give them water after feeding them.

Feeding with white-ants and maggots helps chicks grow up quicker, layers lay more and broilers put on weight quickly.

Thus if you are keeping a few poultry birds and living in a village, you can find white-ants and maggots a good protein feed for them.

But you will have to depend on ready-to-feed balanced mash if you are keeping poultry for business.

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It may be

Respiratory Disease in Poultry

What you think to be Ranikhet or coryza in your poultry birds may not always be the disease you suspect

It is now found in many such attacks that the disease is a chronic respiratory one.

Caused by an organism, it is an air-sac infection; the common symptoms are nasal discharge, sneezing, coughing and gasping, shaking of head, and reduction of appetite. The eyes may not show swelling. Birds lose weight and death occurs, more so in the case of chicks a few weeks old. Egg production goes down in layers.

The disease is carried in the egg, and birds once infected may remain carriers for a long time.

For treatment, the best thing to do is to consult a veterinary doctor. The trachea or the breathing tube of the dead bird should be sent in ice in a thermos flask to the Poultry Research Division, Izatnagar, Uttar Pradesh, for a correct diagnosis.

Since prevention is better than cure, care should be taken to provide good ventilation and sanitation. Overcrowding should be avoided. Birds which recover should be shifted to new grounds, so that they may not get the disease again.

MAKE GRAM PAY MORE

GRAM is a popular crop in many parts of our country, especially in the Punjab. Farmers put more acres under it than they do under wheat in that State. With a little more attention, gram can be a very profitable crop too.

Here are some tips that will help you get a good gram crop.

* Plough the land deep—say up to 9 inches ; gram grows well in a deep-ploughed land.
* Usually farmers do not manure their crop. But experiments show that superphosphate helps gram give higher yields. With this fertilizer applied, you get about four more maunds of gram to an acre.
* Drill two maunds of superphosphate just before sowing, 2 to 2½ inches below the seed-level. The extra four maunds of gram that you will get will cover the cost of superphosphate, and leave you with about 35 rupees as profit.
* Select a good gram variety. There are a number of improved gram varieties. Ask your Gram Sevak or Extension Officer help you select one that is best suited to your land.

  Recently, the Punjab Agriculture Department released *C. 104*, a new variety of *kabuli* gram, for growing under irrigated conditions (except in the hill and submontane districts of Kangra, Gurdaspur and Hoshiarpur). This gram yields at least two maunds more per acre than any of the present varieties. Besides, it has bolder seeds than the local grams. Its seed is very much liked by people and as such fetches a good price—as much as Rs. 21 to 27 per maund. Apart from this, it is also resistant to wilt disease.

  For the rainfed condition, varieties *S. 26.* and *C. 235* (both for irrigated and unirrigated lands) are good.
* Sow gram in the latter part of October. *Desi* gram should be sown in the Punjab from 10th to 25th of October. Early sowing results in more vegetative growth and less of pods. The early-sown crop also gets wilt attack easily.

  Sow the seed five inches deep, in lines one foot apart. Deep sowing results in better germination of seed.
* Give a heavy irrigation before sowing, if you find that there is not enough moisture in the soil. No further irrigation need be given. If, however, the soil dries up too much later, give another irrigation between the middle of December and the middle of January.

This *rabi*, raise a paying gram crop.

Test the soil at the site itself and in only half-an-hour's time with the help of

"GUNTI" SOIL TESTING KIT

Indiscriminate application of fertilizers may not only be wasteful it may eve be detrimental to the crops "GUNTI" Soil Testing Kit eliminates the guesswork in using fertilizers.

Fairly accurate results in the determination of soil fertility and soil-re-action are obtained.

It is simple and extremely helpful.

Each Kit contains 22 items in an attractive sheet metal box consisting of re-agents for determining:—

★ SOIL RE-ACTION (pH)
and estimation of available
★ PHOSPHATES ★ NITRATES & ★ POTASSIUM
in Soils

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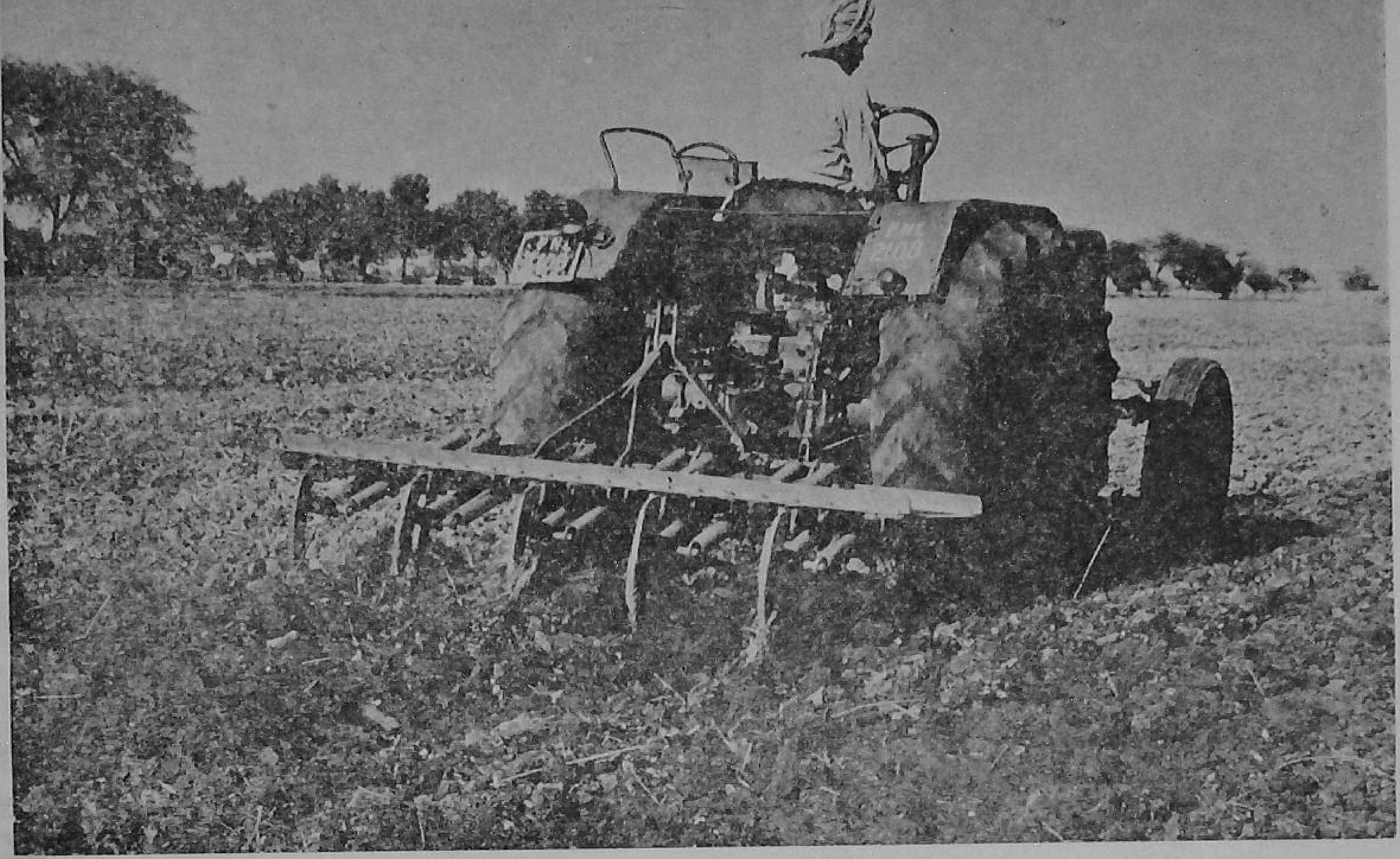


LUDHIANA TAKES A BIG STEP FORWARD

In the Punjab, the District of Ludhiana has ample irrigation facilities and a sound cooperative structure. Moreover, the College of Agriculture and the Research Institute are located here. People in the District are highly receptive to improved farming practices. Hence, Ludhiana offered the greatest scope for undertaking the Package Programme activities.

The Programme started working in the District from *kharif* 1961 after the selection, appointment and training of the staff, were completed.

COVERAGE

In the first year, of the total of 884 inhabited villages in the District, 201 villages scattered in 9 Blocks and with a cultivated area of 1.58 lakh acres (about 22 per cent of the total cultivated area of the District) of which 73 per cent is irrigated, were selected for intensive work.

FARM PRODUCTION PLANS

An important feature of the Package Programme was the development of two types of farm plans for individual farmers, so as to enable them to secure the maximum possible yield by trying the 'package of practices'

kharif season 1961-62, the following plans were prepared :

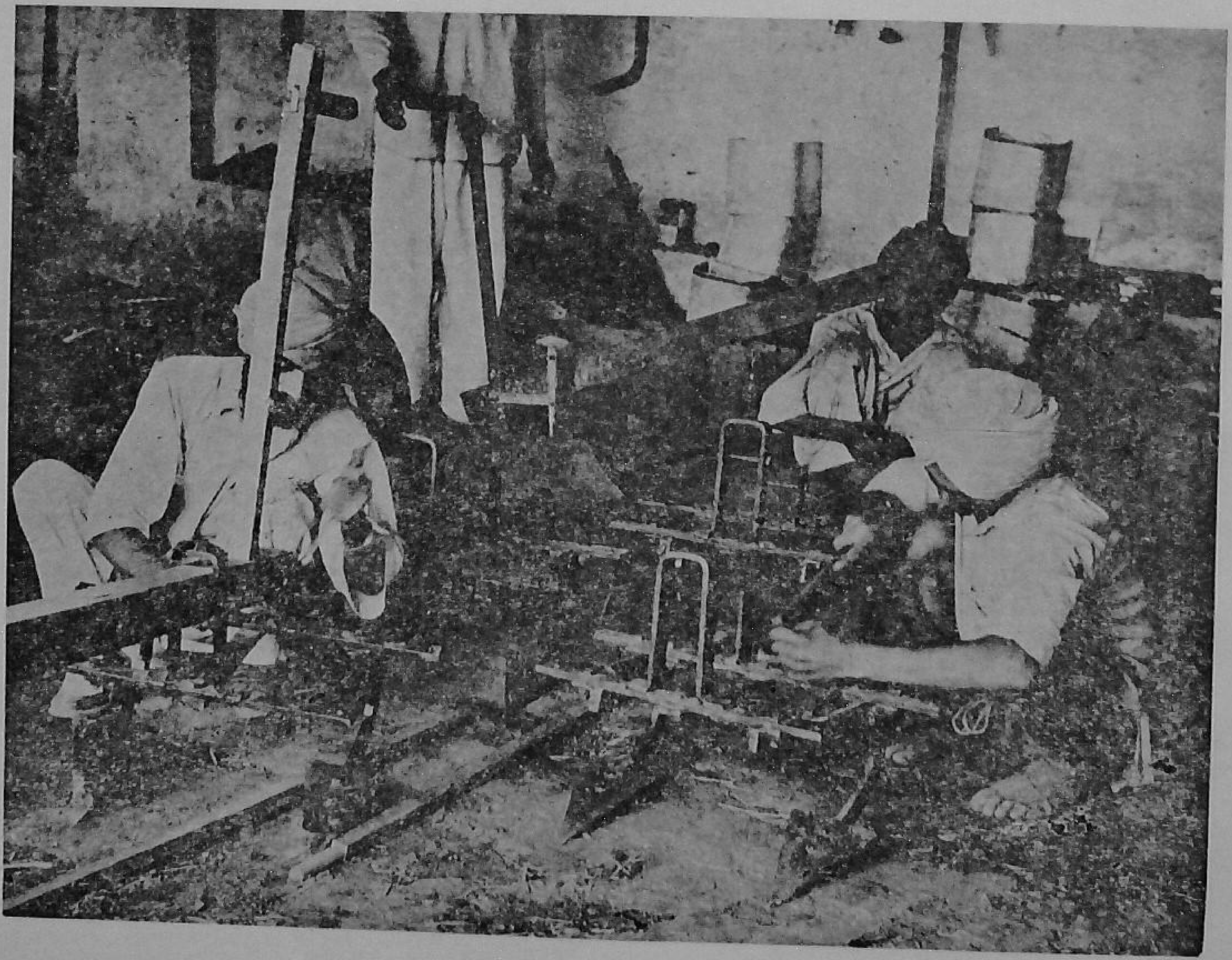
Number of production pnsal	Intensive and extensive	Crop production Plans	Total	Intensive and extensive	Crop production plans	Total
Target	3,000	—	3,000	3,000	15,000	18,000
Actually prepared	2,831	—	2,831	2,831	17,095	19,926

During 1961-62, the crop production plans

as 19,926 farm families. The area covered was 36.3 per cent of the total cultivated area in the District.

In 1962-63, as many as 45,000 more farm families are to be helped with the crop production plans for the *kharif* and *rabi* seasons, separately. In addition, each Agricultural Extension Officer will develop 12 model farm plans, 25 farm plans and 2 *panchayat* land farm plans. Village agricultural plans for 606 villages will also be prepared. The target set for 1962-63 will cover 65 per cent of the farm families in the District.

Villagers are being trained in the repair and use of improved implements



FERTILIZER USE

The average per-acre consumption of fertilizers was 12.80 pounds prior to the introduction of the Package Programme and this was pushed upto 43 pounds per acre during the first year of the Programme. The increase in fertilizer consumption in the District is seen below.

	Quantities needed during 1961-62	*Quantities used up to 31-3-1962*
Ammonium sulphate	7,333 tons	11,383 tons (Ammonium sulphate and Calcium ammonium nitrate together)
Calcium ammonium nitrate	2,214 tons	
Superphosphate	1,000 tons	2,001 tons
Potash	440 tons	16 tons

During 1962-63, it is proposed to supply fertilizers of all kinds to the extent of 22,158 tons.

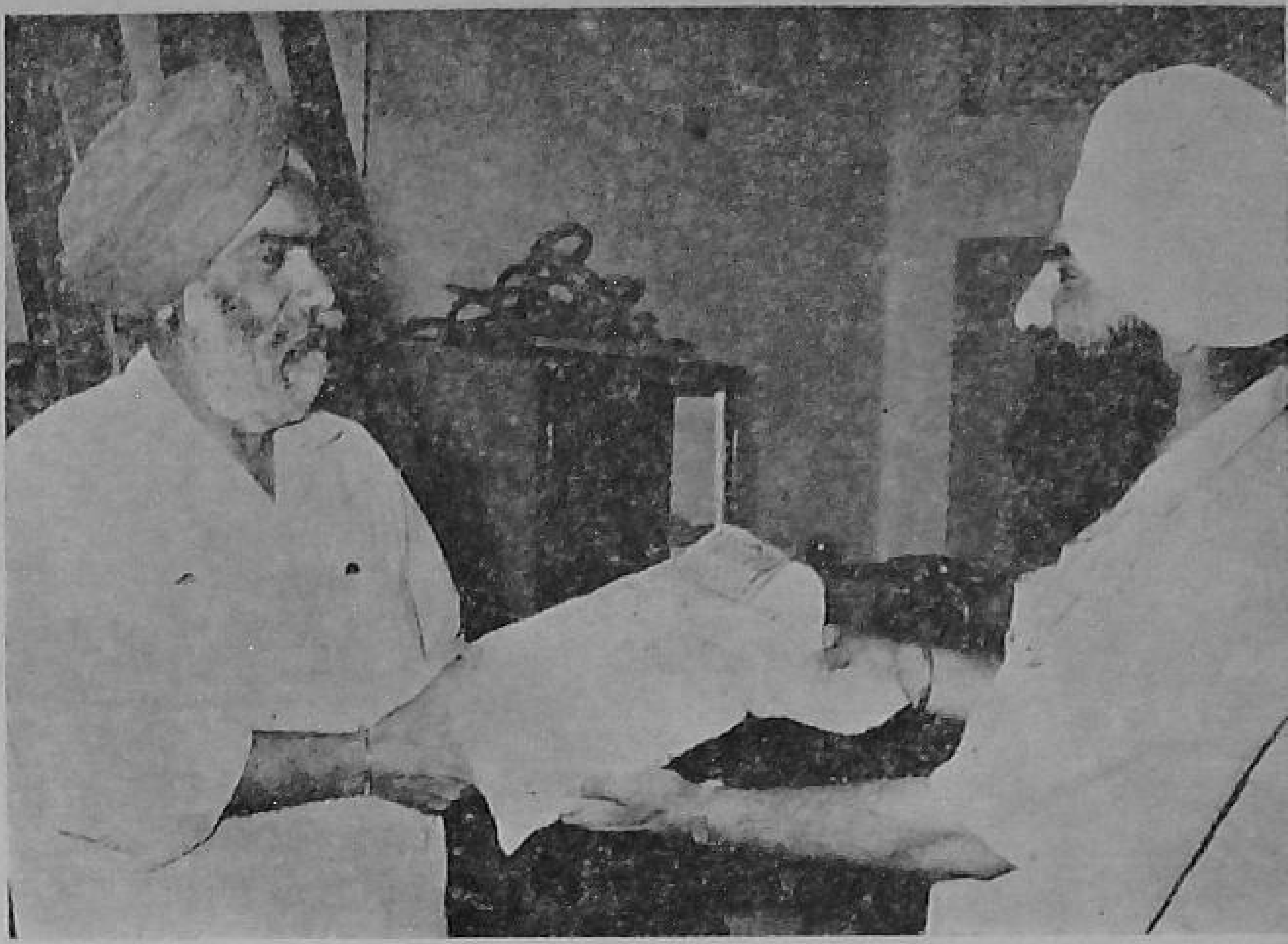
IMPROVED SEED SUPPLY

Larger quantities of improved seed were supplied to farmers during the year, as can be seen below.

Crops	*Quantities needed during 1961-62*	*Quantities actually consumed up to 31-3-62*
Wheat	16,000 mds.	10,710 mds.
Gram	500 mds.	612 mds.
Cotton (American)	6,400 mds.	4,500 mds.
Cotton (*Desi*)	200 mds.	45 mds.
Hybrid maize	500 mds.	100 mds.
Jantar	600 mds.	337 mds.

IMPROVED IMPLEMENTS

Rapid development of agriculture depends on the use of improved implements as much as on other factors like fertilizers, etc. Hence, their use has been given an important place in the Programme.



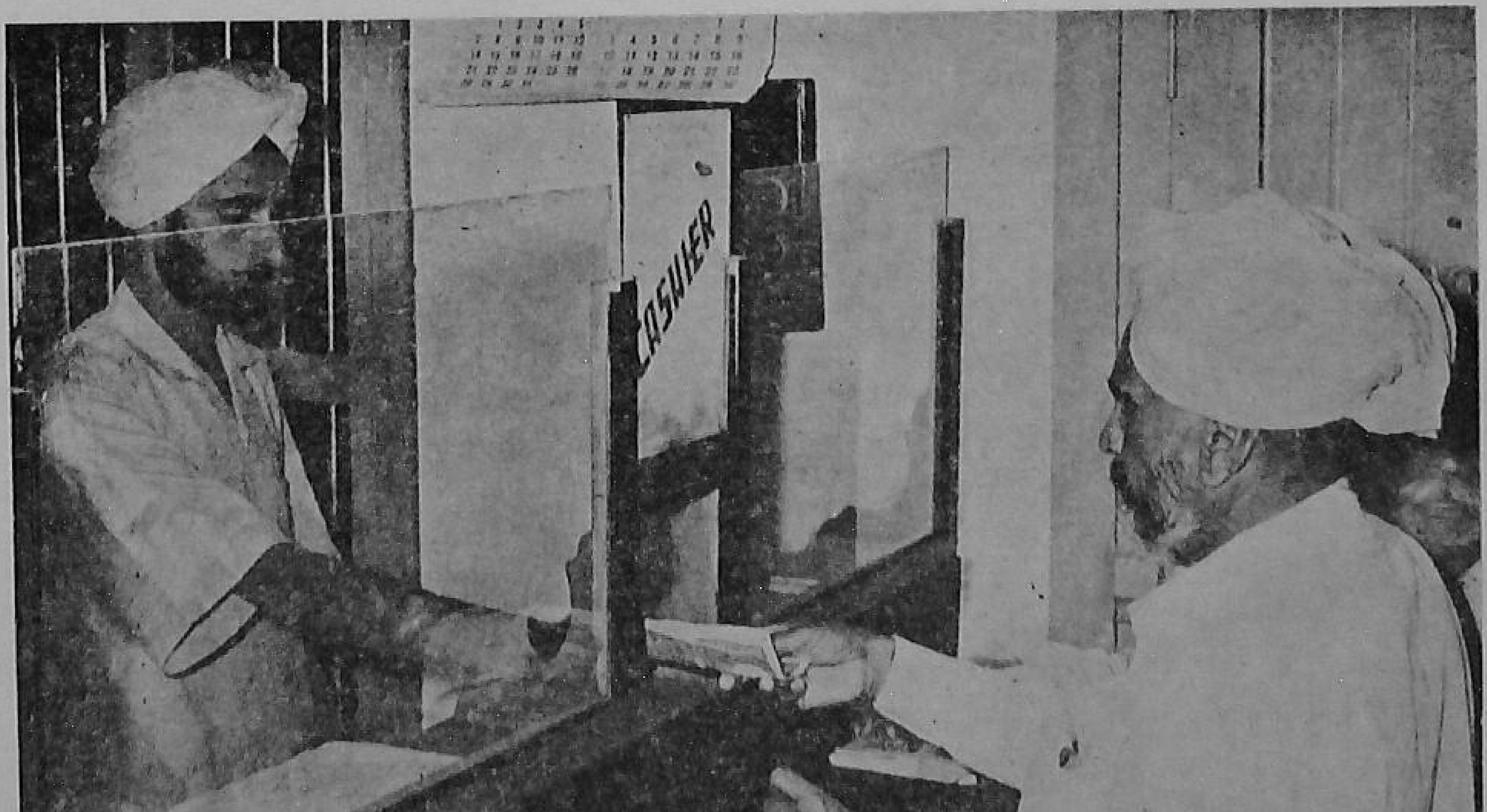
Improved seeds are supplied to farmers in plenty

Implements	*Number needed during 1961-62*	*Numbers received*	*Numbers distributed*
Furrow-turning ploughs	500	1,750	140
Iron ploughs (improved *desi*)	2,000	9,600	468
Triphalis	3,200	910	6
Single-row cotton drill	1,600	860	—
Bar harrow	800	150	—

During 1962-63 it is so planned that no farmer in the District will be without an iron plough, a furrow-turning plough and a *triphali*. A sum of Rs. 3 lakhs is being provided by the Department of Agriculture for the purchase of such implements from approved fabricators. The improved ploughs will be sold on a 25 per cent subsidy through Co-operative Sales Depots. A sum of Rs. 8 lakhs is being provided from the IADP funds and about Rs. 1 lakh from the State funds for the grant of taccavi loans to farmers for the purchase of power threshers. In all,

Fertilizer supply is assured within the bullock-cart-distance

Farmers get the credit as and when needed



14,415 improved implements, 90 tractors, 45 threshers and 360 pneumatic-tyre cart wheels are proposed to be supplied under this Programme.

SCIENTIFIC DEMONSTRATIONS

Demonstrations, particularly the composite ones, where all the recommended practices are tried out on one single crop, deserve special mention. During the year 1961-62, as many as 3,000 demonstrations were planned for the *kharif* and *rabi* seasons against which 1,387 were laid out during *kharif* and 1,255 during *rabi* (total: 2,642) as indicated below:

Kharif			*Rabi*		
Crop	*Number of demonstrations laid out*	*Percentage of increase in yields*	*Crop*	*Number of demonstrations laid out*	*Percentage of increase in yields*
Cotton	401	25	Wheat	1,049	Results not yet available
Groundnut	185	41.4	Gram	133	
Maize	410	32.1	Potatoes	69	
Paddy	19	24.9	Fodder	4	
Sugarcane	360	Results not yet available			
Vegetables (Potatoes)	10	51.8			
	1,387			1,255	

CREDIT

In the 201 villages selected for the Package work, there are 260 primary credit societies with a membership of 35,860. These societies disbursed credit to the extent of Rs. 10.20 lakhs (Rs. 3.37 lakhs as short term and Rs. 6.85 lakhs as medium term) on the basis of production plans during the year ending June 1962. In addition to cooperative credit, the Government advanced Rs. 34 lakhs during 1960-61 and Rs. 22.4 lakhs during 1961-62.

During 1962-63, it is estimated that farmers would need Rs. 135 lakhs as short-term credit and Rs. 34 lakhs as medium-term credit. This will be in addition to the medium-term loans from other sources for minor irrigation projects and purchase of tractors.

STORAGE GODOWNS

Ninety godowns would be the need of the District. Of these, 28 existed at the start of the Programme and 19 have since been constructed. Forty-three are under construction at present; 205 godowns have been taken on hire.

IMPLEMENTS WORKSHOP

The workshop attached to the Agricultural College is proposed to be strengthened under the Programme. The workshop will test and develop improved implements, undertake manufacture of prototypes, train the village artisans and farmers in the repair and use of implements, etc.

SOIL-TESTING LABORATORY

The soil-testing laboratory at Ludhiana is to be strengthened for testing a greater number of soil samples. During 1961-62, 2,216 soil samples and 84 water samples from Ludhiana District have been tested. When the existing laboratory is strengthened, it is expected that some 30,000 samples will be tested every year. A soil survey of 20,000 acres in the District has also been conducted.

QUALITY SEED PROGRAMME

Four seed-processing units have been set up in the Seed-testing Laboratory at the Agricultural College, Ludhiana. The laboratory will test some 3,600 seed samples in the current year. Fifty-four thousand maunds of wheat seed will be given solar treatment against smut. It is also proposed to enlist 900 farmers as Registered Seed Growers in the District.

Plans are to distribute 16,000 maunds of wheat seed, 5,000 maunds of cotton seed, 1,300 maunds of *desi* cotton seed, 110 maunds

Godowns have been built to store improved seed, fertilizers and other supplies

of hybrid maize seed and 135 maunds of groundnut seed this year. It is also proposed to produce 4,500 maunds of good quality wheat seed on Departmental farms in the District. The 135 Regisetred Seed Growers will also produce 30,000 maunds of good wheat seed during the current year.

BENCH-MARK SURVEY AND ASSESSMENT

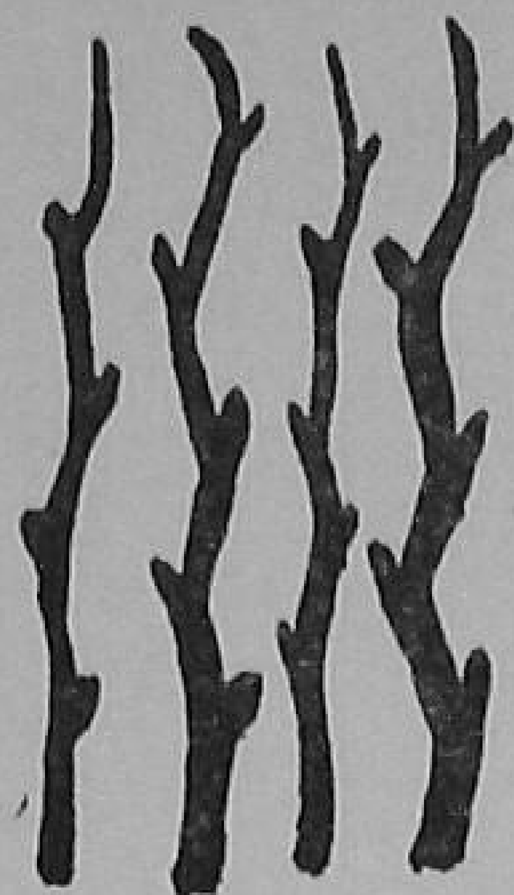
The work was started in December 1960 when resource data by random sampling was collected from 72 villages in the District. A second phase of bench-mark survey dealing with crop-cutting experiments was also carried out during *rabi* 1960-61 and on *kharif* crops in 1961. It is also proposed to carry out village case studies and the work in this connection has recently been started. It will be guided by a rural sociologist.

During the year 1962-63, crop-cutting experiments on all the important crops will be conducted in all the nine Blocks. There will be in all, 1,786 such experiments in the District, besides 324 experiments to be conducted in control areas outside the District. Some 864 agricultural families in 108 villages will be selected for study under bench-mark survey spread over 9 Blocks in the District, against 286 families in 36 villages in the central area of the 3 adjoining Blocks.

INFORMATION AND PUBLICITY

For 1962-63, a detailed information education programme has been drawn up. It includes staging of some 1,800 dramas and film shows, distribution of 1,44,000 posters and 72,000 folders. It is also proposed that the Intensive Agricultural District Programme staff should give radio talks, school talks and contribute features to local and central magazines. It is also proposed to print copies of a IADP Bulletin for the use of field staff and others. *Melas* and exhibitions will also be arranged.

By J. P. NAURIYAL

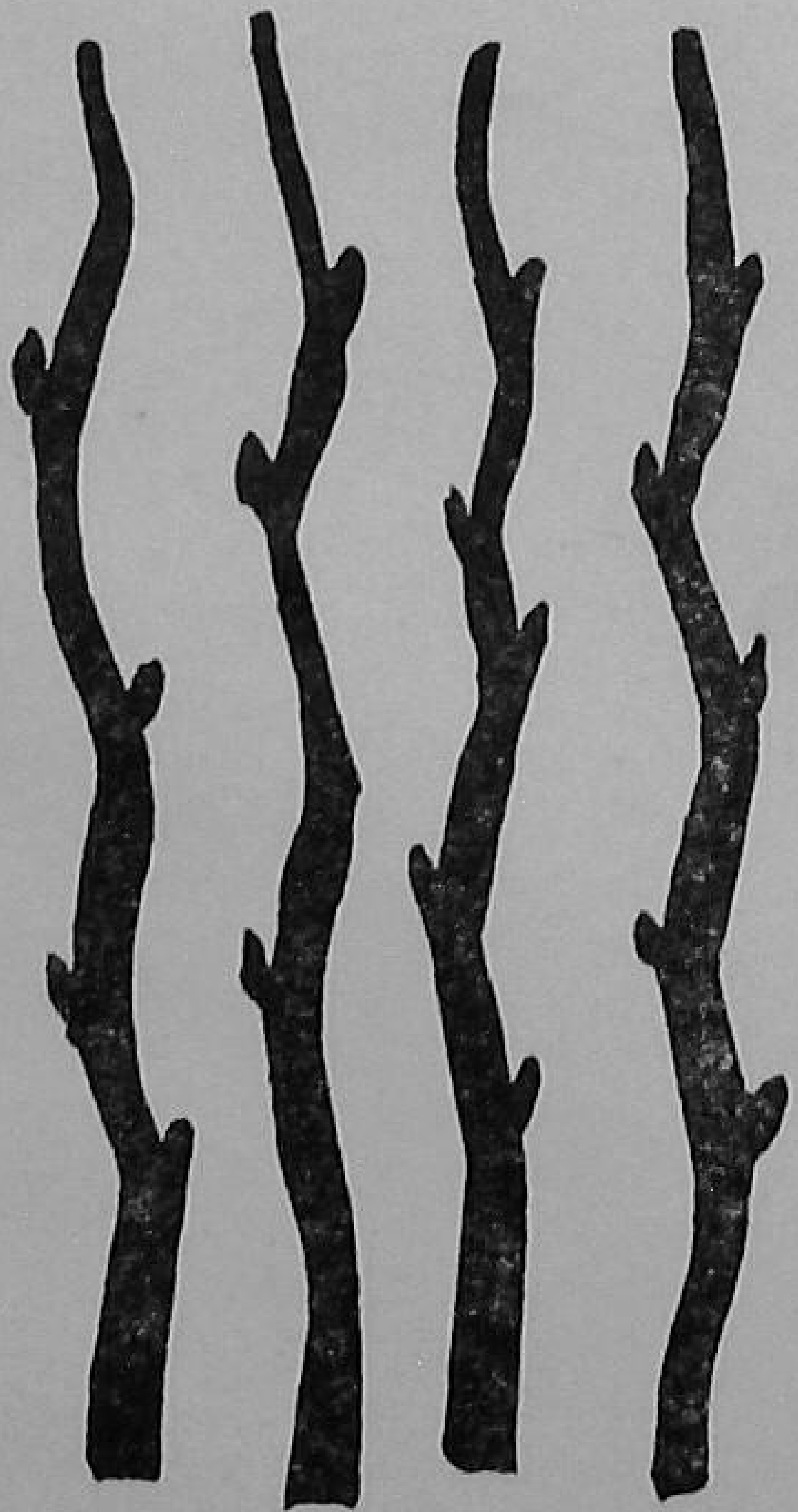


FOR the past few years, many apple-growers are planting their orchards with apple varieties belonging to the 'Delicious' group.

For getting fruits of good size and quality over a long time from these trees, they should train their apple trees properly.

A properly trained tree prevents over-crowding of branches and provides enough sun and shade to the fruits to develop well.

APPLE TREES need proper training



But the way you train the trees will depend largely on their growing habit.

1. The upright growth habit

Trees an upright with-growth habit should be trained in such a manner that the branches may spread out and make the trees more 'open.' To do this, make cuts just above the buds located on the outer sides of twigs and branches.

2. Tendency to form narrow-angled crotches

The Delicious type varieties like other apple varieties with an upright growth habit, have the tendency to form narrow-angled weak crotches. The formation of many such narrow-angled crotches gives the tree a weak structure. Hence, while training, take care to select wide-angled and well-spaced branches

which will subsequently form the permanent scaffolds of the tree.

Also remember that the natural auxins (growth-promoting substances) produced in the terminals of shoots help in the development of wider angles. Allow a few shoots to grow temporarily just above the permanent branches. However, do not allow such shoots to grow longer than six to eight inches ; pinch them back regularly.

3. Over-dominant lower branches

The lowermost branches of Delicious type varieties often grow so rapidly that within a couple of years, they may equal or even surpass the original trunk-girth. This results in the formation of a weak tree, having two or three main branches arising very near each other within a short vertical distance on the trunk. Good training requires that the main scaffold limbs should be well-spaced, on and around the trunk. Check the growth of lower branches by a light heading-back of the first scaffolds. It is better to select the properly-spaced permanent branches early.

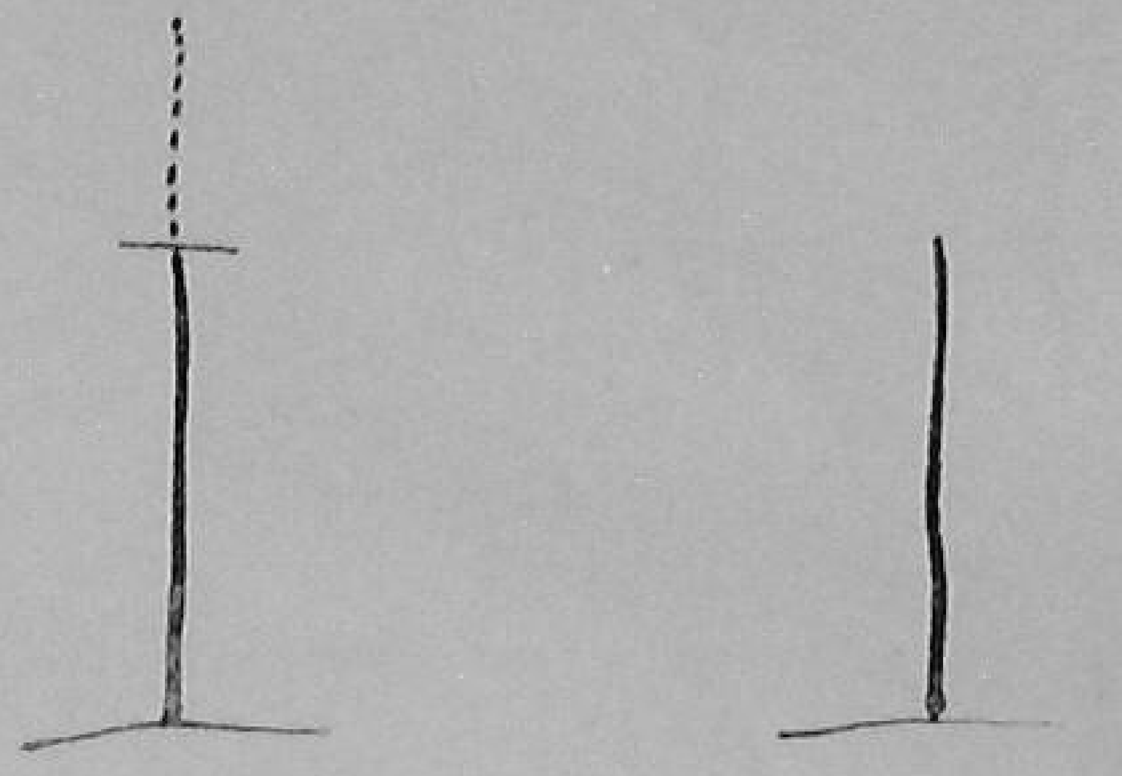
HOW TO TRAIN

Apple trees yield best when trained to the modified leader form. This is how you train apple trees into modified leaders.

1. At planting time—choose the head height and cut the whip accordingly

Decide upon the height of the head, that is, the distance from the ground at which the lowermost scaffold branches are to be kept on the tree trunk. In case of low-headed trees, this distance is usually 20 to 22 inches, whereas in high-headed trees the lowermost scaffold may be kept as high as 4 to 5 feet from the ground.

Lower-headed trees enable easy pruning, spraying and harvesting. But you will have to think of other things also. For example, if you are to raise a suitable intercrop, then high-headed trees are better. The recent trend, however, is in favour of low-headed trees, even though the orchard may be intercropped.

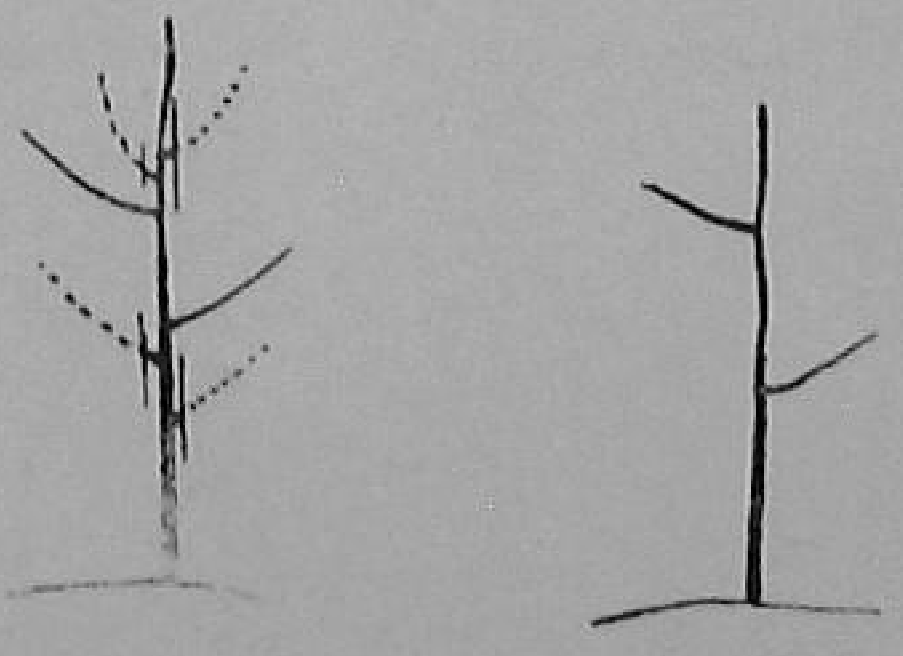


Before pruning After pruning

To produce a low head, cut back the whip (one year old grafted plant) at a height of $2\frac{1}{2}$ to 3 feet from the ground, at the planting time. This will induce branch formation in the lower parts of the trunk during next summer.

2. First summer—select the primary scaffold

Remove all branches which are lower than 20 to 22 inches from the ground. Select one



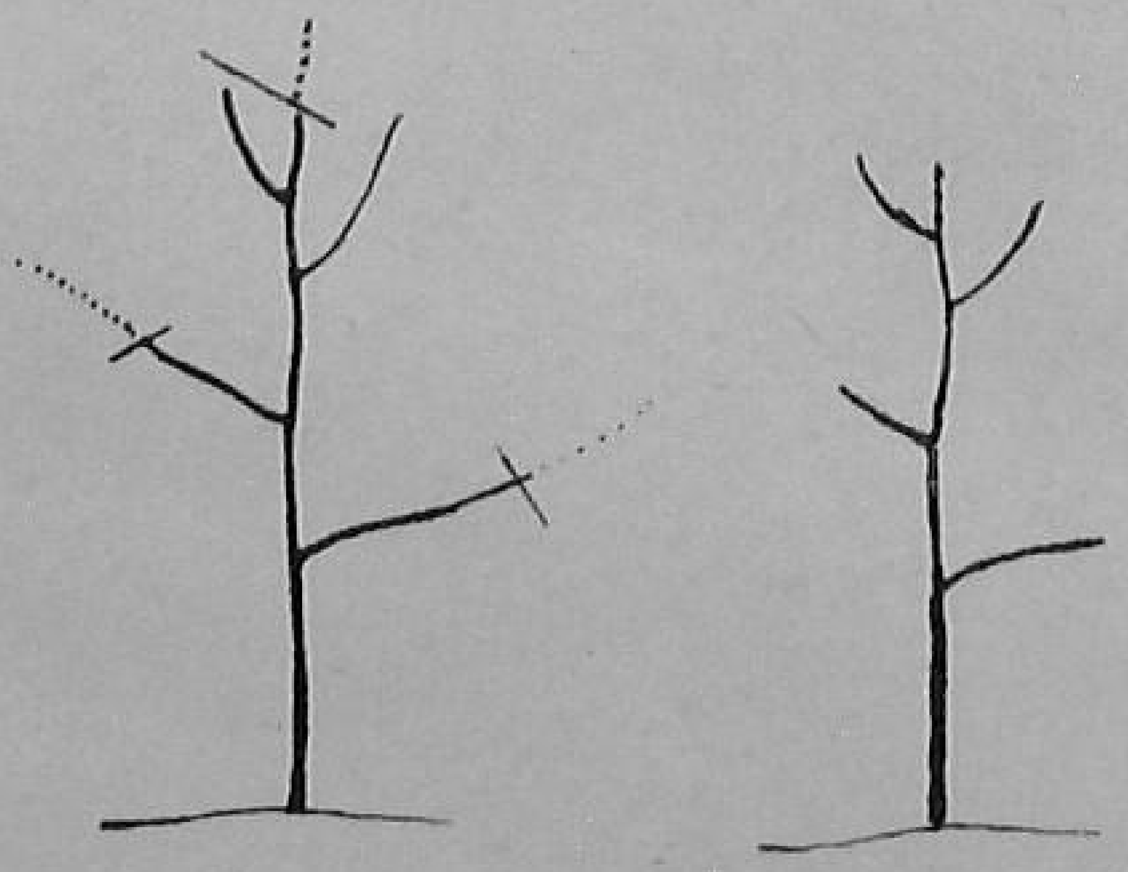
Before pruning After pruning

or two wide-angled (more than 60 degrees) branches for making the primary scaffolds. These should be spaced six to eight inches apart and preferably located in opposite directions. You may allow a few shoots to grow temporarily above the permanent branches to induce wide-angle formation between the main branches and the tree trunk.

For the same reason, leave the rapidly-growing shoots just below the cut made at planting time unpruned, till each one is six to eight inches long. Always keep the temporary growth small at the top as well as lower down the trunk by pinching off their rapidly-growing tips, otherwise the growth of permanent branches will become stunted. When the top shoots become six to eight inches long, remove all but one. The remaining shoots will form the modified leaders of the tree.

3. First dormant pruning

Prune the lowest permanent branch to 20 to 30 inches and all above that to 12 to 14 inches length, to check the overdominance of

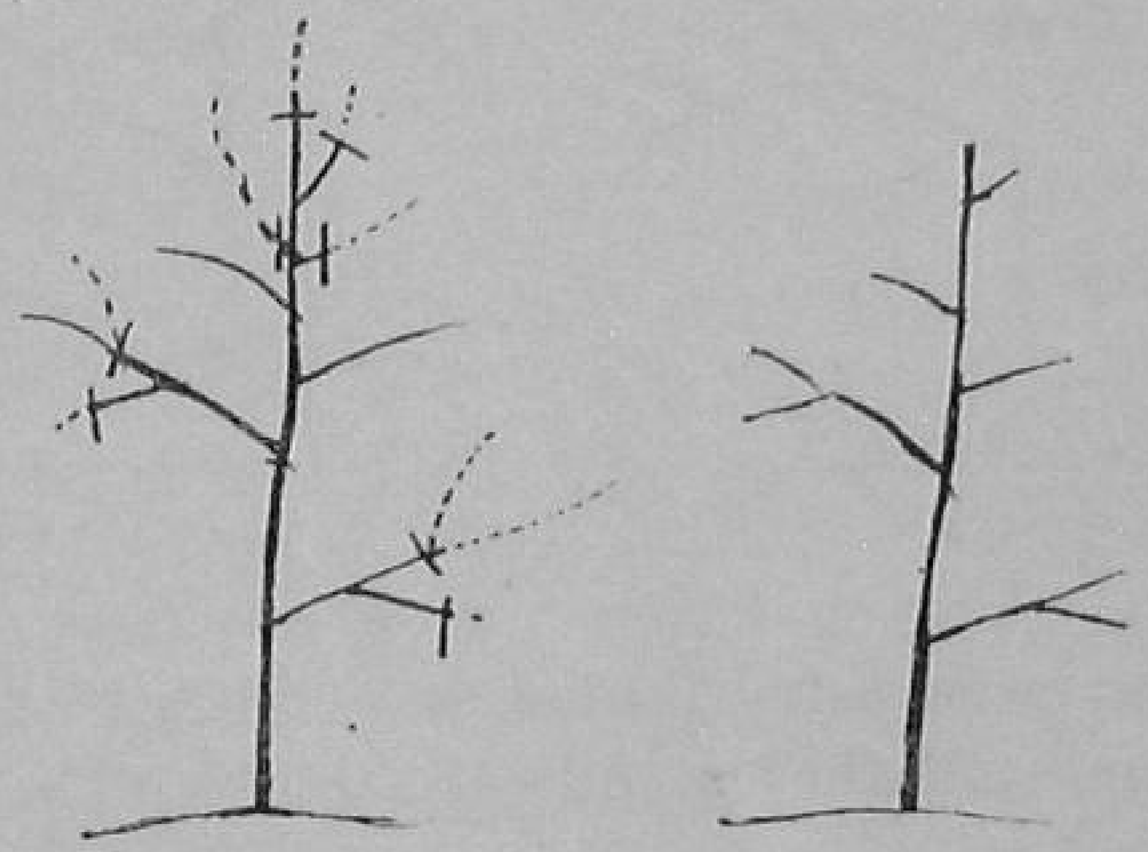


Before pruning After pruning

the lower branches. Head the leader 10 to 12 inches above the highest branches. Temporary branches should be stubbed to five to six inches length.

4. Second summer pruning

Select two or three more scaffolds besides those already selected during the previous summer. Space them six to eight inches apart vertically on the trunk. Each scaffold should be at least 90 degrees around the trunk from the next one below it.



Before pruning After pruning

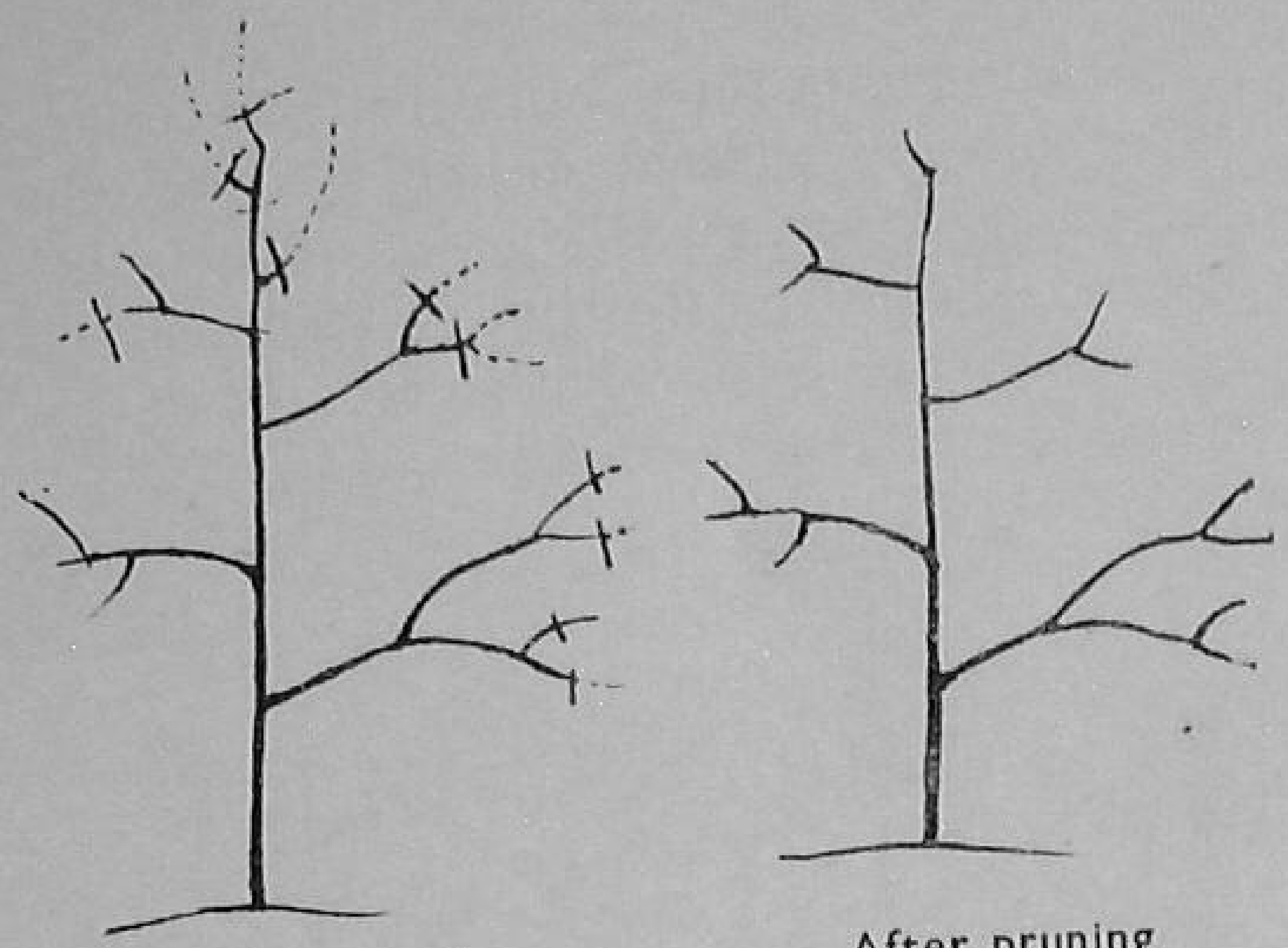
Thin out all the undesirable growth. The temporary growth should be cut back to stubs, five to six inches long in the case of one-year-old growth and 10 to 12 inches long in the case of two-year-old twigs. As the tree grows older, allow these stubs to grow longer, but not more than two feet long.

If the tree is growing vigorously, head back the secondary scaffold branches.

5. Second dormant pruning

By this time, the selection of primary scaffolds (four to six in number) should have already been completed. At the second dormant season, the secondary scaffold branches are to be chosen.

On each primary branch, select two secondary branches and remove all others. Now, the head of the tree will consist of eight



Before pruning

After pruning

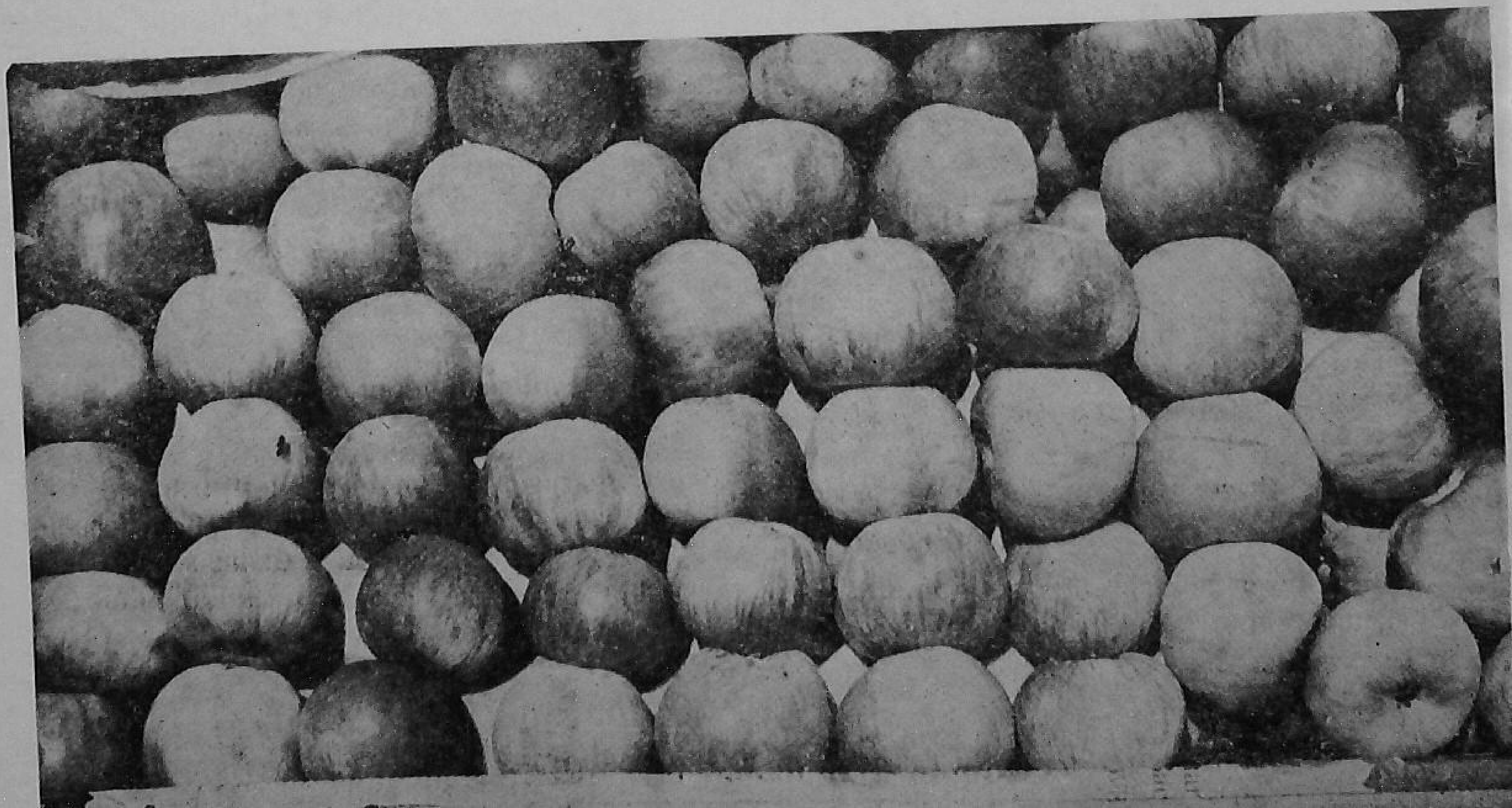
to ten evenly-distributed secondary scaffolds. Other superfluous, misplaced and interfering branches should be removed. You may, however, keep a few small branches which may develop from the primary scaffolds, for early fruiting wood.

6. Subsequent prunings

From now onwards, reduce pruning operations to the minimum; only thinning is required. Avoid summer pruning, otherwise it may dwarf the whole tree.

The scaffold system of the tree having been properly established by now, the leader is modified or suppressed by heading it above an outward lateral bud. This way you build up the basic framework of the tree. When this is done, you have no difficulty in the management of the trees, and they will give high yields of good quality fruits for many years.

To get apples like these, see that you pay good attention towards pruning of your apple trees



Shri Paliwal—winner of many crop competition awards

HOW HE MADE A WHEAT-ACRE YIELD 58 MAUNDS

By N. K. VERMA

FARMERS around Ingotha, Sadar Tahsil of Hamirpur District, Uttar Pradesh, when faced with any farming problem, seek Shri Laxmi Chand Paliwal's advice; because Paliwal has been winning awards in crop competitions year after year.

For three years in succession, his potato crop has been winning the first prize at the District level crop competitions. In 1959-60 he harvested over 477 maunds of potato from one acre.

Similarly, he has been winning prizes for his wheat crop from 1954-55 either at District or Zonal or State level. In 1960-61, he won the first prize at the District-level competition for harvesting 48 maunds and 6 seers of *jowar* from an acre.

In that year, he also saw his dream come true when he won the first prize of 5,000 rupees at the State-level wheat competition, by harvesting 58 maunds 22 seers and 4 chhataks of grains per acre from his wheat-plot.

"It is all due to the U.P. method of wheat cultivation," says Sri Paliwal, "I have found this method, with a few changes, best suited to our area."

This is how Sri Paliwal succeeded in getting 58 maunds 22 seers and 4 chhataks of wheat per acre.

The plot on which he raised this crop has light soil. It is irrigated by a pucca masonry well.

Sri Paliwal firmly believes that for good crop-yields, both organic and inorganic manures should be applied in proportionate doses.

In summer, Shri Paliwal applied 20 cartloads (about 200 maunds) of farmyard manure. Then he broadcast *dhaincha* seed at 15 seers per acre in the first week of July when the monsoon set in. In the second week of August, the *dhaincha* crop was turned in as green manure. The field was kept submerged under the water during September.

In the first week of October when the water was let out from the *bundhi* (bund), one maund of ammonium sulphate was broadcast on the moist, sticky field. Later on when the soil became friable, it was ploughed six times with a *desi* plough and a fine seed-bed was prepared.

Shri Paliwal always uses improved seed which he mixes with the farmyard manure before sowing.

On the 26th of October, *Pb. 591* variety of wheat seed was dibbled at 6 seers per acre. The first irrigation was given in the last week of December when the crop was also top-dressed with one maund of ammonium sulphate and weeded.

In the last week of January, the field was irrigated again. The last irrigation was given in the last week of February. The field was valued for the competition in the first week of April and then the crop was harvested and threshed.

One acre of wheat from this plot gave him a net profit of Rs 807.

This is the economics of his wheat cultivation :

	Cost per acre in rupees
Preparatory cultivation	
1. Ploughing six times	36
Seeds and sowing	
2. Cost of seed and dibbling	80
Manures and manuring	
3. Farmyard manure at 20 cartloads per acre and its application	50
4. Cost of *dhaincha* seed—broadcasting and covering the same	20
5. Cost of ammonium sulphate (2 maunds per acre)	32
After-cultivation	
6. Weeding and hoeing	12
7. Irrigations (three)	50
Harvesting, threshing, etc.	
8. Harvesting	20
9. Threshing and winnowing	35
10. Rent and other miscellaneous charges	15
Total expenditure	350

Yield of grain : 58 maunds 22 seers 4 chhataks
Yield of straw: 110 maunds

Sale price of grain at Rs. 16 per maund :	Rs. 937/-
Sale price of straw at Rs. 2 per maund :	Rs. 220/-
Total income	Rs. 1,157/-
Total expenditure	Rs. 350/-
Net income	Rs. 807/-

JAPANESE TECHNIQUES FOR INDIAN PADDY FARMS

IN the summer 1959, four Japanese farmers arrived in village Sorana near Saharanpur in Uttar Pradesh. These farmers, experienced in paddy cultivation in their own country, had arrived, at the specific request of the Government of India, to demonstrate the techniques of paddy farming to our farmers. They brought their own machinery, both manual and power-operated, like the single bullock ploughs, threshers, power tillers, pumps and powers sprayers. They took on lease a 3½-acre farm from a local farmer, and started working in the *kharif* of 1959. They carried out all the cultural operations themselves and depended least on hired labour.

Japan like India is a rice-growing country, but the Japanese follow a highly developed system of paddy cultivation so evolved as to suit the small farms, which farmers there usually possess.

The four Japanese farmers, Tanaka, Miyaishi, Nishizaka and Kano, had come to show how the techniques they follow back home for raising paddy could also be used in our small farm units here.

Working for four agricultural seasons, till the *kharif* of 1961, the Japanese farmers produced impressive results. In 1960, they could raise paddy yield from the normal of 15 maunds per acre in the area to 52 maunds for the first crop and 72 maunds for the second crop. They also raised a wheat crop in the same field, which yielded 24½ maunds of grain per acre.

The techniques the Japanese farmers had used to get such good yields, it was seen, consisted of three important factors. The first, they followed the practice of balanced fertilization of the crop with organic and inorganic manures. The second, they gave great importance to water management, drainage of the fields receiving as much care as did irrigation. The third was mechanization of cultivation which helped them carry out all cultural operations quickly and in proper time, according to schedule. Any delay in field operations, as our farmers also know, results in lower rice yields.

The implements the Japanese farmers used attracted the attention of the neighbouring farmers. These were particularly easy to handle and work in small plots of even up to one eighth of an acre. The single bullock plough they used aroused a lot of interest. This plough, worked by one bullock, can do as much work as is done by a pair of bullocks.

Encouraged by the results of this experiment, it was felt that such demonstrations should also be extended to other paddy

The Japanese introduced this single-bullock plough at their Saharanpur farm which attracted particular attention from the neighbouring farmers

The Japanese have special implements for intercultural operation. The picture shows two of such implements in action

areas. In April this year, the Government of India entered into an agreement with the Government of Japan for organizing demonstration farms in various parts of the country. Four such farms, at Chakuli in Sambalpur District, Orissa, Ranaghat in Nadia District, West Bengal, Arrah in Shahabad District, Bihar, and Vyara in Surat District, Gujarat, were taken up as locations for the demonstrations.

The results of the Japanese method of paddy cultivation were impressive. This Japanese farmer from Saharanpur farm is seen with a bumper crop of paddy

The equipment and the technical know-how at these farms have been provided by the Japanese Government. Each Centre has a team of Japanese experts, consisting of a Project leader and three other members. The Project leader is a qualified technician with considerable experience of farming and extension. He is assisted by one Agricultural Engineer and one Agronomist. The fourth member of the team is a farmer with some experience of Indian conditions.

These teams are now working at these locations, and their mode of working and the equipment they use are being keenly observed by farmers in the neighbourhood. The rice crops they are raising now show good promise of turning out to be heavy yielders.

The Japanese method of paddy cultivation introduced into India a few years ago helped raise our rice production to a certain extent. The demonstration farms now being run by the Japanese experts will be another step forward towards better rice growing in our country.

MASTITIS

EARLY PRECAUTIONS NECESSARY

INFLAMED udder and the "blind" teats are symptoms of mastitis, a very serious and infectious disease affecting milch animals. Affected animals yield less milk, and that too of poor quality and dangerous for human consumption.

A study on mastitis in Maharashtra State has shown that by observing strict hygiene and effective curative measures, mastitis can be controlled. It was seen that Pencillin in doses of 50,000 to 100,000 International Units repeated daily for three to four days gives good results in the early stages of infection.

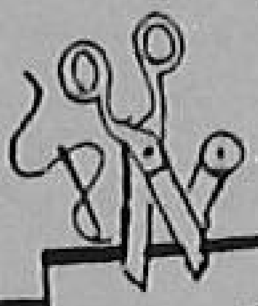
Early detection and great care are advised to keep the loss of cattle low, as the advanced cases of mastitis are difficult to cure. It is recommended that such affected animals should be disposed of in the interest of other healthy animals.

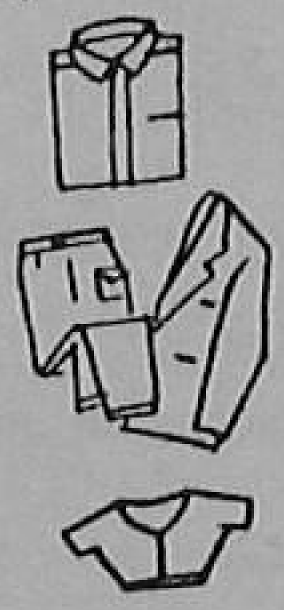
DEAL *Only* IN

METRIC LENGTHS

With the compulsory use of metric linear measure throughout the country from 1st October, 1962, transactions are now in terms of the metre.

Here are some equivalents of standard garment lengths. Familiarity with the new unit will help you to give up thinking in terms of yards.





SHIRT	:	2 metres and 75 centimetres (2.75 metres) instead of 3 yards
COAT	:	2.75 metres } instead of 3 yards each
TROUSERS	:	2.75 metres } instead of 3 yards each
BLOUSE	:	0.90 metre instead of 1 yard

A Sari of 6 yds. will be 5½ metres in length.

1 Metre = 1 yd. and 3⅜ inches If a yard of cloth cost Re. 1.00 nP., a metre of the same cloth will cost Re. 1.09 nP.

METRIC SYSTEM Means

SIMPLICITY & UNIFORMITY

ISSUED BY GOVERNMENT OF INDIA

DA 62/432

SPECIAL FARM FEATURE

A POTATO KING OF JULLUNDER

Sardar Iqbal Singh inspecting his extensive potato field

By M. L. N. IYENGAR

"MEET Sardar Iqbal Singh Dhillon of Khurla-Kangra, a potato king of the area"—this is how I was introduced by the local Agricultural Officer to a healthy, prosperous looking Sikh gentleman of medium height.

Iqbal Singh, a man of great self-confidence, has built up a potato farm of 60 acres almost from scratch in the vicinity of Jullundur City. He raises two crops a year and his average yield ranges from 300 to 350 maunds per acre as against the usual 200 maunds in the region. He has his own irrigation arrangements and has built a cold store.

SELF-MADE MAN

He did not inherit his potato kingdom. He built it up acre by acre, tuber by tuber. Luck played no part in it. On the contrary, the partition ofthe country left him almost a destitute 15 years ago. He lost his fertile 125-acre farm in the canal colony of West Pakistan and came to India as a refugee. He was allotted 14 acres of land in the Garden Colony near Jullundur City.

Iqbal Singh toyed with the idea of growing potatoes after having failed to raise either a citrus garden (that was one of the conditions of land allotment), or sugarcane and *Colocasia* crops due to unfavourable soil and climatic conditions.

A man of action, he immediately planned to put his idea of potato cultivation into practice. He first thought of having a reliable source of irrigation and sunk a tube-well which proved successful. Encouraged, he straightaway planted nine acres under 'Darjeeling Red Round' potato, a variety that was commonly grown roundabout the area. The crop gave him an encouraging profit, and that laid the foundation of his present well-paying potato farm.

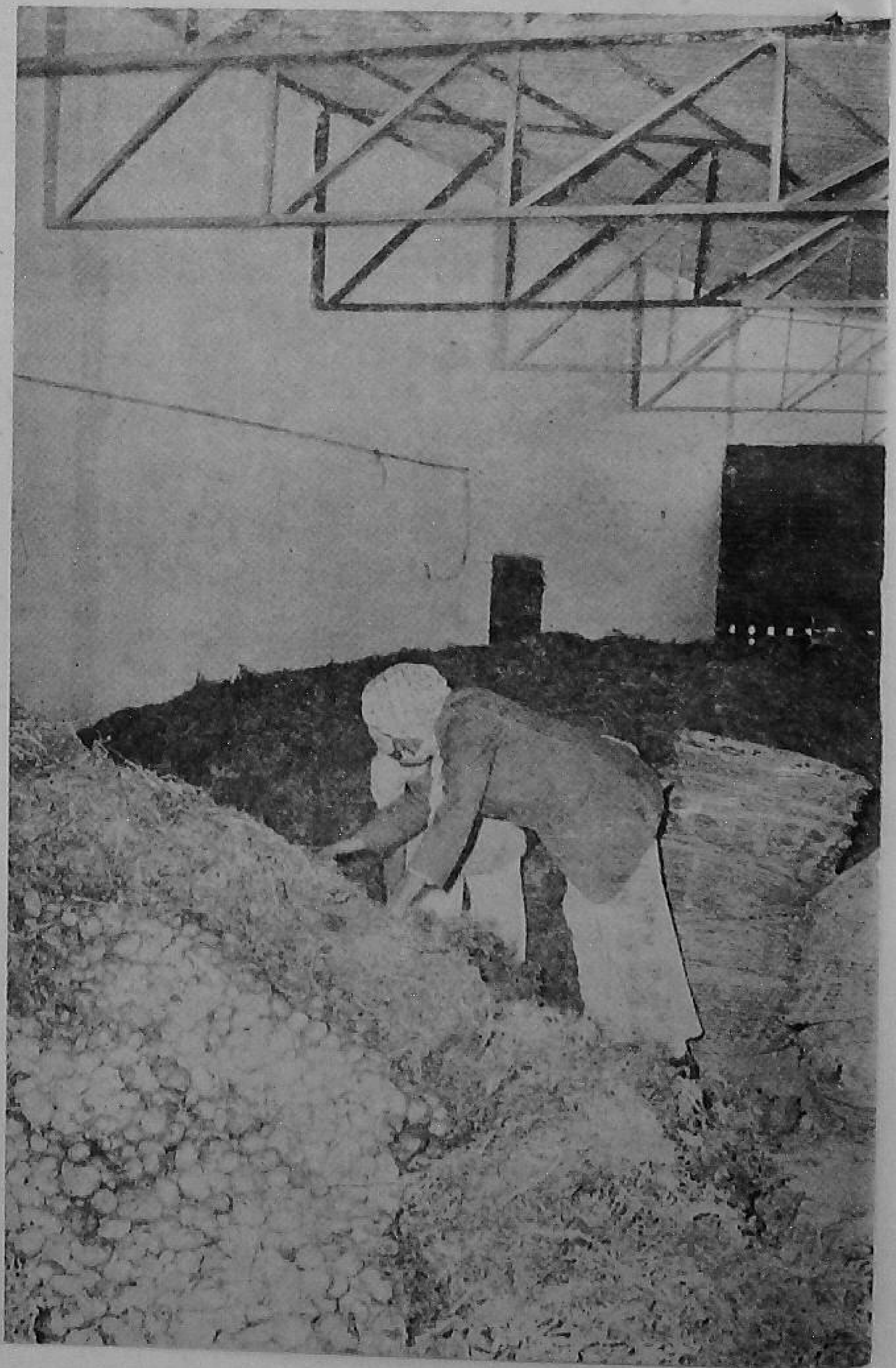
USES A BETTER VARIETY

During the past four years he has been raising two crops of potatoes on 60 acres between the months of September and May. He now grows 'Up-to-date', an early variety. He found that with 'Darjeeling Red', which is a late variety, it was difficult to raise a second crop. Moreover, 'Up-to-date' gives more marketable tubers, requires less fertilization and yields better.

GOES IN FOR ENOUGH MANURES

His quota of town compost from the Jullundur Municipality is sufficient just for 24 acres. So he applies four truckloads on an acre every fourth year. To supply enough plant food to the crop, he applies 4 cwt. of ammonium sulphate, 4 cwt. of superphosphate and 1 cwt. of potassium sulphate for the winter crop. He has found that with adequate potassium in the soil the skin of the tubers becomes stronger, the size bigger and the plants more healthy and disease-resistant.

The cold storage built by Sardar Iqbal Singh



ATTENDS TO PLANT PROTECTION MEASURES

Iqbal Singh, a practical man, takes no risk with pests and diseases, and follows a definite schedule of spraying—one spraying of 'Endrin' during winter, and three sprayings each of Bordeaux mixture and 'Endrin' to a secure a pest-free crop in spring.

RAISES HIS OWN SEED

He raises his own seed according to the technique of raising a disease-free potato seed evolved and perfected by the Central Potato Research Institute, Simla. Potato yields are very badly affected by virus diseases which are spread by plant lice or aphids. These aphids are either very inactive or almost absent from April to December. By raising a seed crop during these months, the growers can get their own disease-free seed, and thus save about Rs. 400 per acre which they normally spend on imported hill seed.

ADOPTS LATEST TECHNIQUES

Another technique that the experts have evolved and Iqbal Singh uses is breaking the dormancy of freshly-harvested tubers and making them sprout quickly by dipping them in a chemical solution like thiourea. This enables him to use the tubers lifted in November-December as seed for the spring crop in January-February. In other words, such treatment of tubers has helped him raise two crops in quick succession.

TAKES TO MECHANIZATION

Iqbal Singh is thinking of cutting down his cost of production further by mechanizing some of the pre-planting operations, as are being tried at the Experimental Station, Jullundur. Having a basic background of agriculture (he studied agriculture at the Lyallpur Agriculture College), he is always alive to new ideas and techiques available from the Research Stations and is very enthusiastic to put them into practice on his farm.

His self-confidence and receptivity to new ideas has put him in the vanguard of the agricultural revolution that has hit rural Punjab.

'CHOCOLATE TREE'

GROWS WELL IN THE SOUTH

Experiments so far conducted go to show that cacao, which gives us chocolate, can be grown with advantage in Kerala, Mysore and Madras.

Cacoa requires sufficient shade, well-distributed rains during both the monsoons and a well-drained soil. Cacao should not be planted on lands sloping southwards with severe exposure to the afternoon sun, as it effects the plants adversely.

Two hundred cacao seedlings should be transplanted in an acre. On an average, the cost of cultivation comes to about Rs. 125 per acre per year.

The plant starts bearing from sixth year onwards, and yields 5 to 10 pounds of pods.

Interested farmers can get their cacao seedlings from the Agricultural Research Station, Taliparamba in Kerala State, or the Kallar and Burliar Fruit Research Stations in Madras State.

By KANTHIMATHI KUMAR

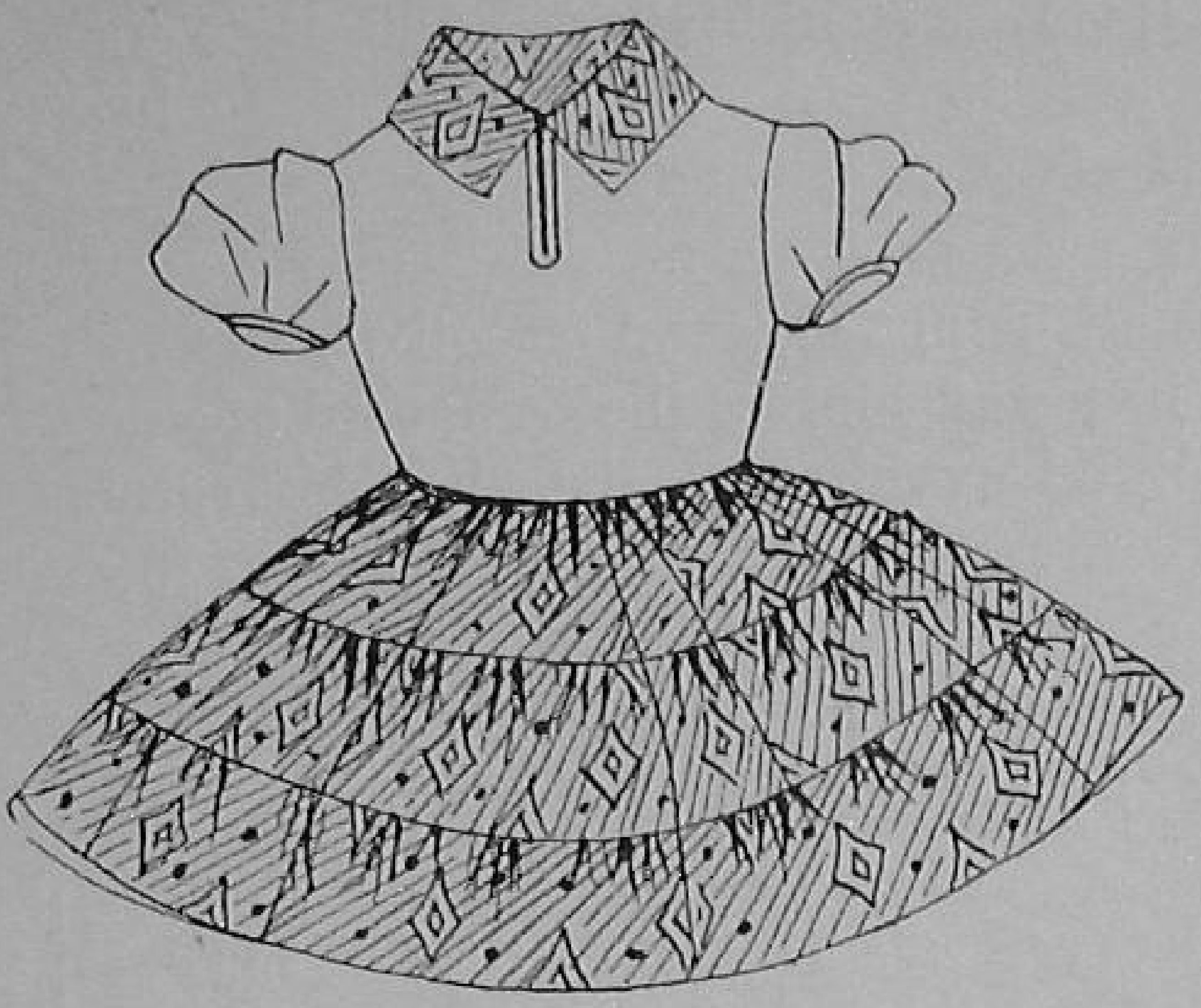


Fig. 1

A FROCK with a three-piece SKIRT from an OLD SAREE

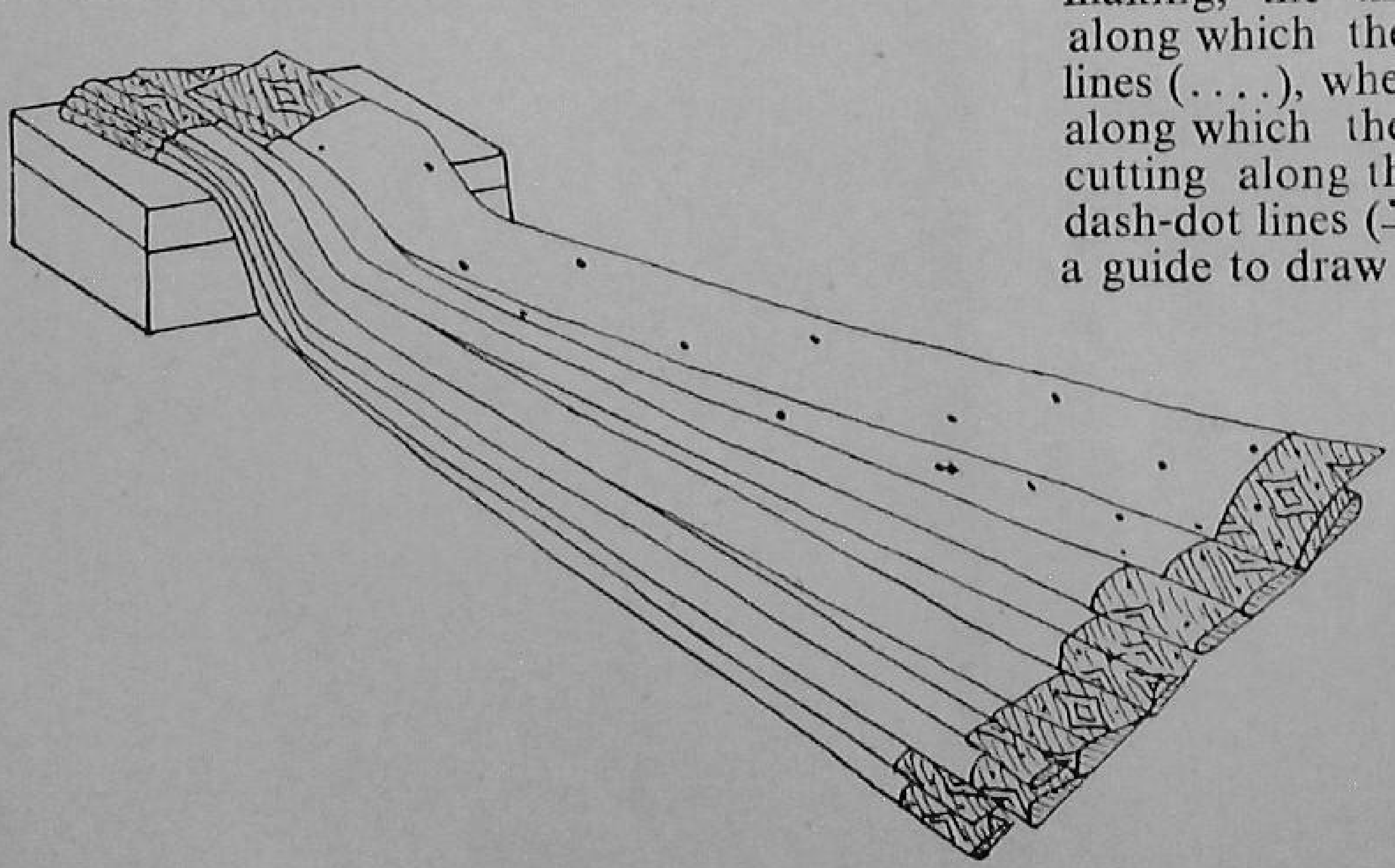


Fig. 2

A plain old saree with a printed border is ideal for making this frock with a three-piece skirt. The saree taken as an example is plain and white, 6 yards long and 44 inches wide, with a printed border $4\frac{1}{2}$ inches wide and a nice *palav*.

MEASUREMENTS OF THE FROCK

Length 19″. Waist-length 9″. Chest 22″. Waist 20″. Shoulder-width 9″. Sleeve-length $5\frac{1}{2}$″. Sleeve-band 9″.

I. How to make the pattern-pieces of the frock.

(*i*) *General instructions for following the diagrams.*

(*a*) In the diagrams, the different measurements are given within arrows, the arrowheads showing the exact limits of the measurements. Wherever space does not permit, the measurements are given without the arrows or with the arrows pointing to the measured length. A few measurements are explained with reference to the alphabets in the diagram and are given below the diagrams.

(*b*) In the diagrams, the thin lines (__) denote the edges of the paper taken for pattern-making, the thick lines (__) denote the line along which the pattern is cut. The dotted lines (. . . .), wherever shown, denote the lines along which the pattern is cut after the first cutting along the thick lines is done. The dash-dot lines (—.—) denote the lines used as a guide to draw the curves etc.

(*c*) In the diagrams containing the word 'fold', the rectangle consisting of the pattern represents the folded paper taken for pattern-making. Therefore, while taking the papers for drafting the pattern, take double the width indicated in the diagram in order to allow for the fold.

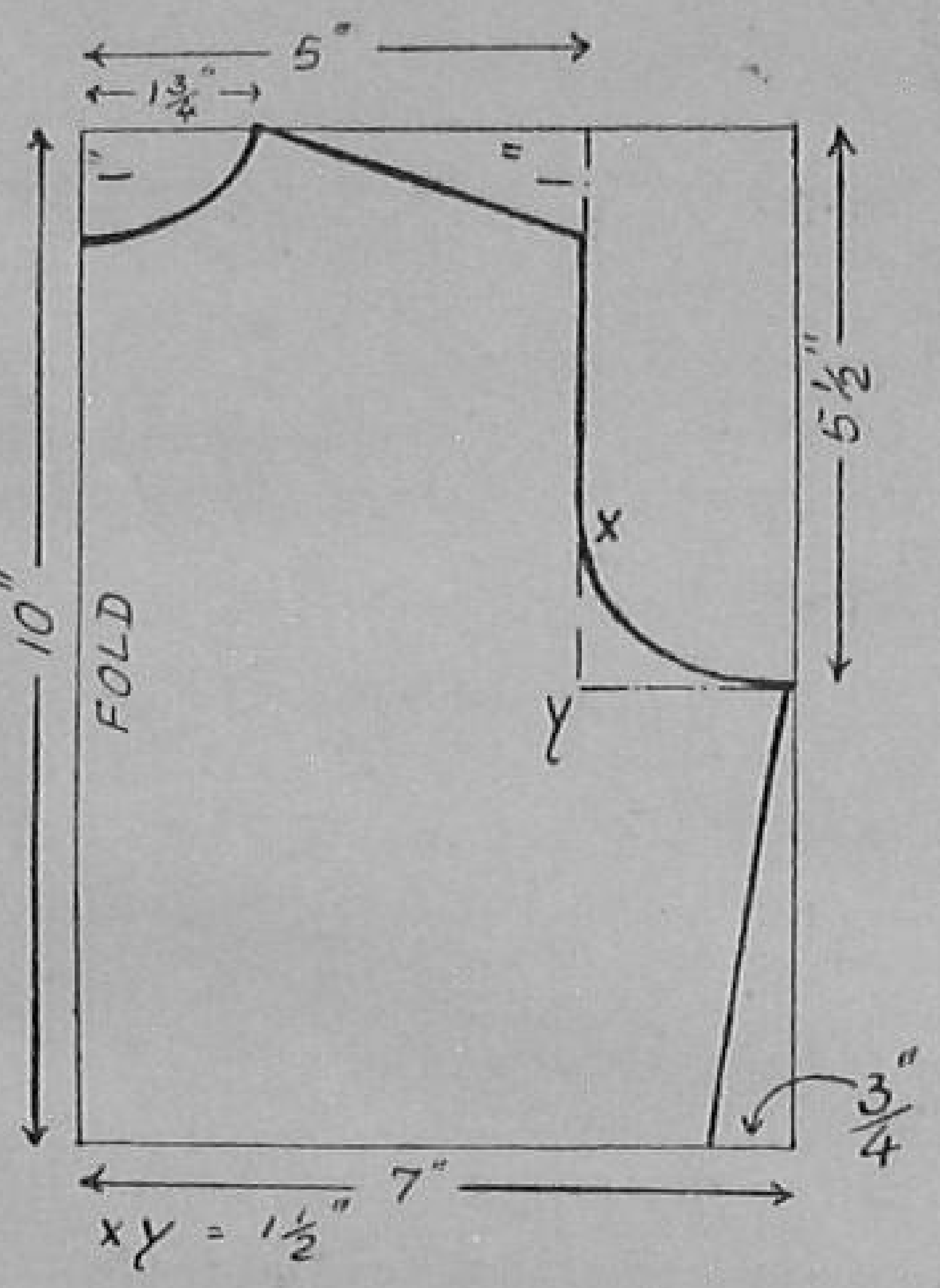


Fig. 3. Back of bodice

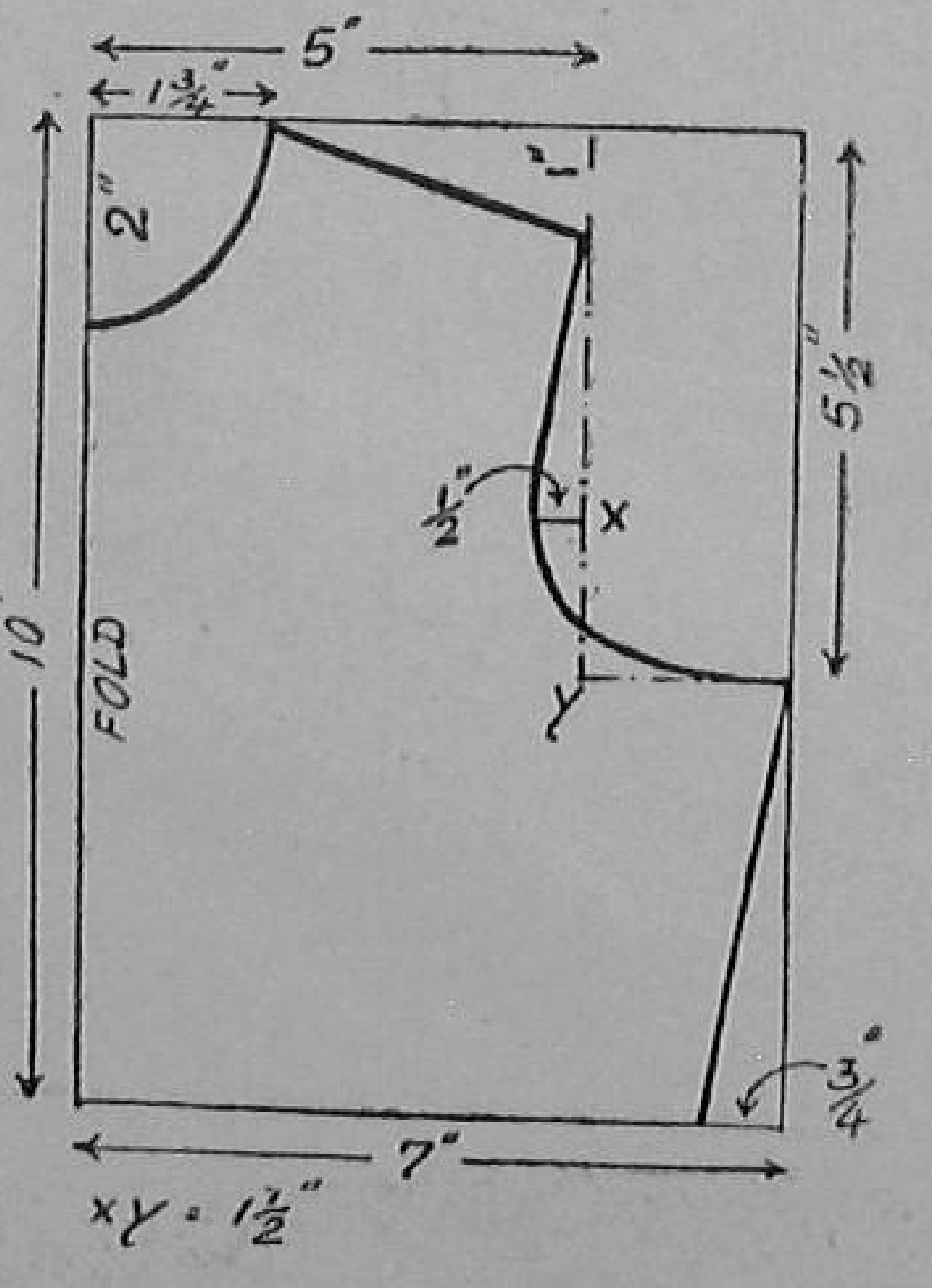


Fig. 4. Front of the bodice

(*d*) Mark the different points, showing the limits of the measurements on the paper taken for pattern-making, and draft the pattern as you proceed from point to point.

(ii) Particular instructions for making the pattern-pieces of the frock

(a) *The back and the front of the bodice. (Follow Fig. 3 and Fig. 4):* Draft the patterns of the back and the front of the bodice and cut along the thick lines. Along the central fold of the front bodice, cut a slit 3" long from the neck downwards to form the front-opening.

(b) *Sleeves (Fig. 5):* Draft the sleeves and cut along the thick lines first. Open out the fold and cut along the dotted curve on

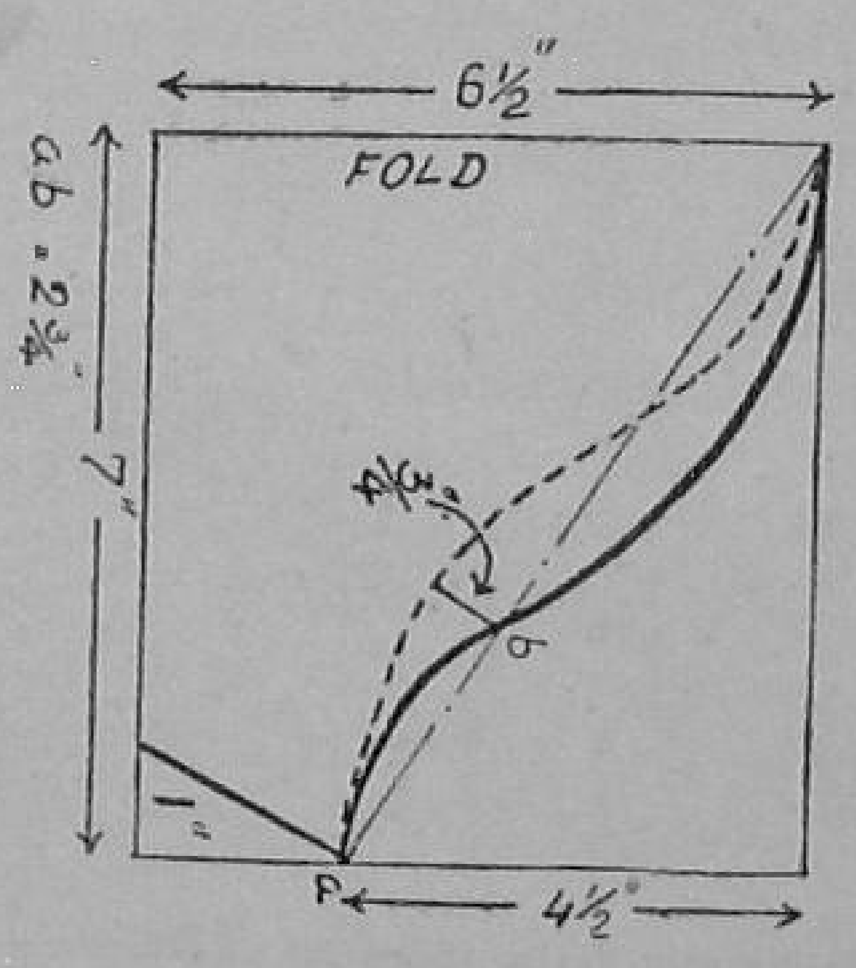


Fig. 5. Construction of sleeves

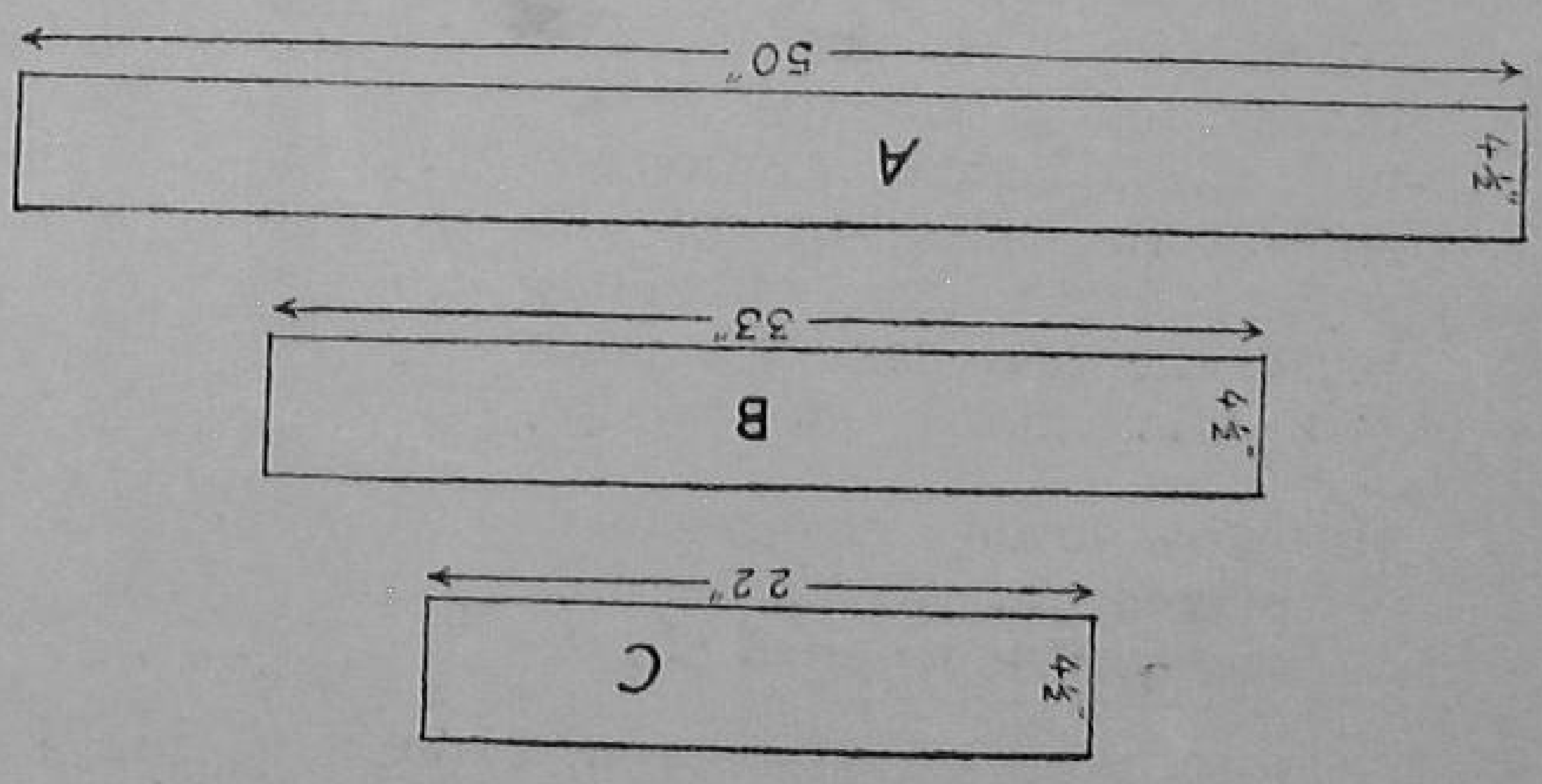


Fig. 6. Construction of the three-piece skirt

one half of the sleeves only. Prepare two sleeves. The portion cut deeper in the sleeve-head is to be attached to the front of the bodice. Therefore, note that the right sleeve is to be differentiated from the left sleeve.

(c) *Skirt* (*Fig. 6*): The skirt is made of the three pieces A, B and C. 'A' is the lower-most piece, 'B' is the middle piece and 'C' is the topmost piece. Draft the patterns of A, B and C and cut two pieces in each of A, B and C for the front and the back of the skirt.

Shorten the width of each of the three pieces A, B and C of the back skirt by cutting off 2", and mark them as A′, B′ and C′ respectively. As the waist-line of the back bodice will be less than that of the front bodice when made, the width of the skirt for the back is to be less.

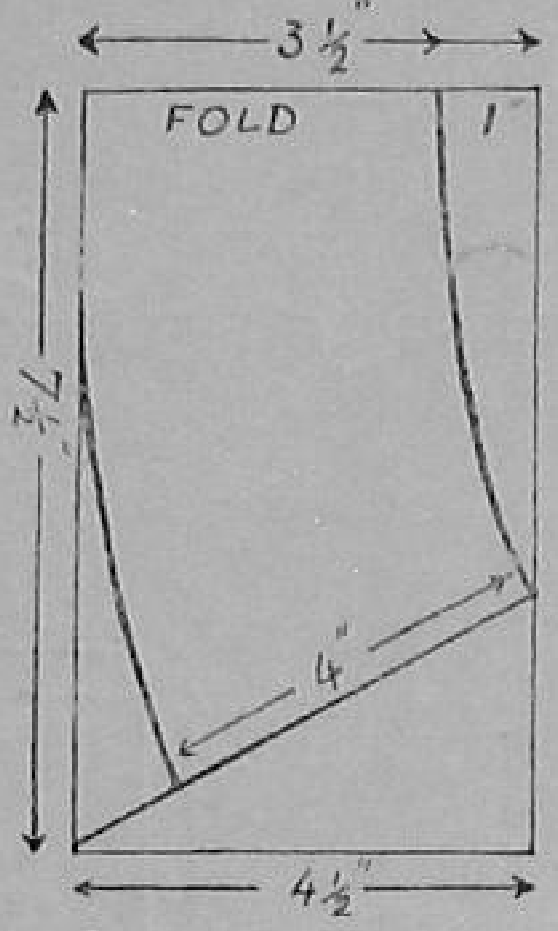


Fig. 7. The collar

(d) *Collar:* (*Fig. 7*) : Draft the collar and cut along the thick lines. Prepare two collars, of which one will form the lining.

(e) *Sleeve-bands* : For the sleeve-bands, cut two strips of paper 10" long and 2" wide.

II. Preparing the saree for the layout of the pattern-pieces (Fig. 8)

Iron the saree properly and cut off one of the borders. The border that is cut will be 4½" wide and 216" long. From one end of the saree, cut off the *pallav*. From the remaining part of the saree, cut off a piece of the plain fabric, 15" in width.

III How to lay the pattern-pieces on the saree-bits and cut the pattern (Fig. 9)

Pin the pattern-pieces of the front and the back of the bodice, the sleeves, the sleeve-bands and the collar to the 15" wide bit, cut from the saree, and cut the pattern-pieces. Note that the collar is cut from the border. Pin the pattern-pieces of the front and the back of the skirt viz. A, B, C, A′, B′ and C′ to the long piece of the border, cut from the saree, and prepare the skirt-pieces.

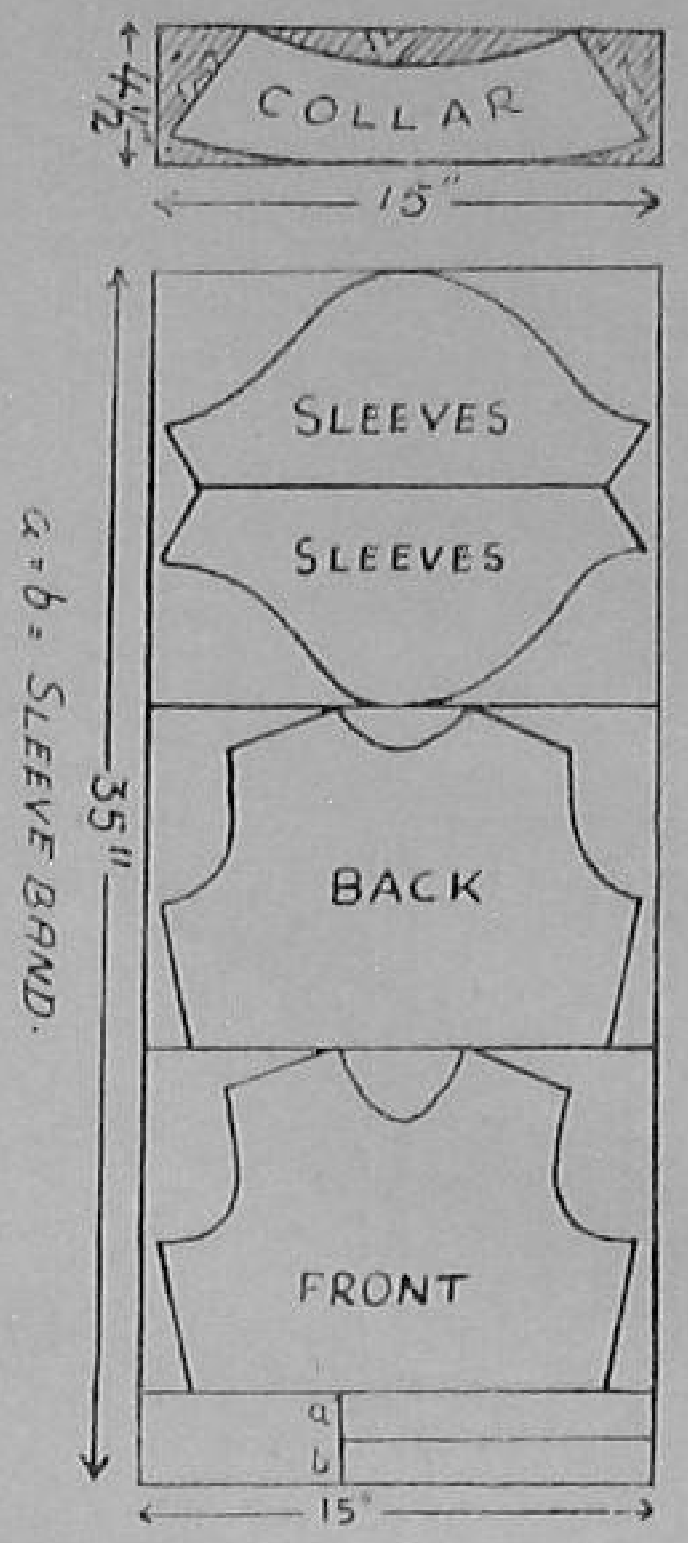
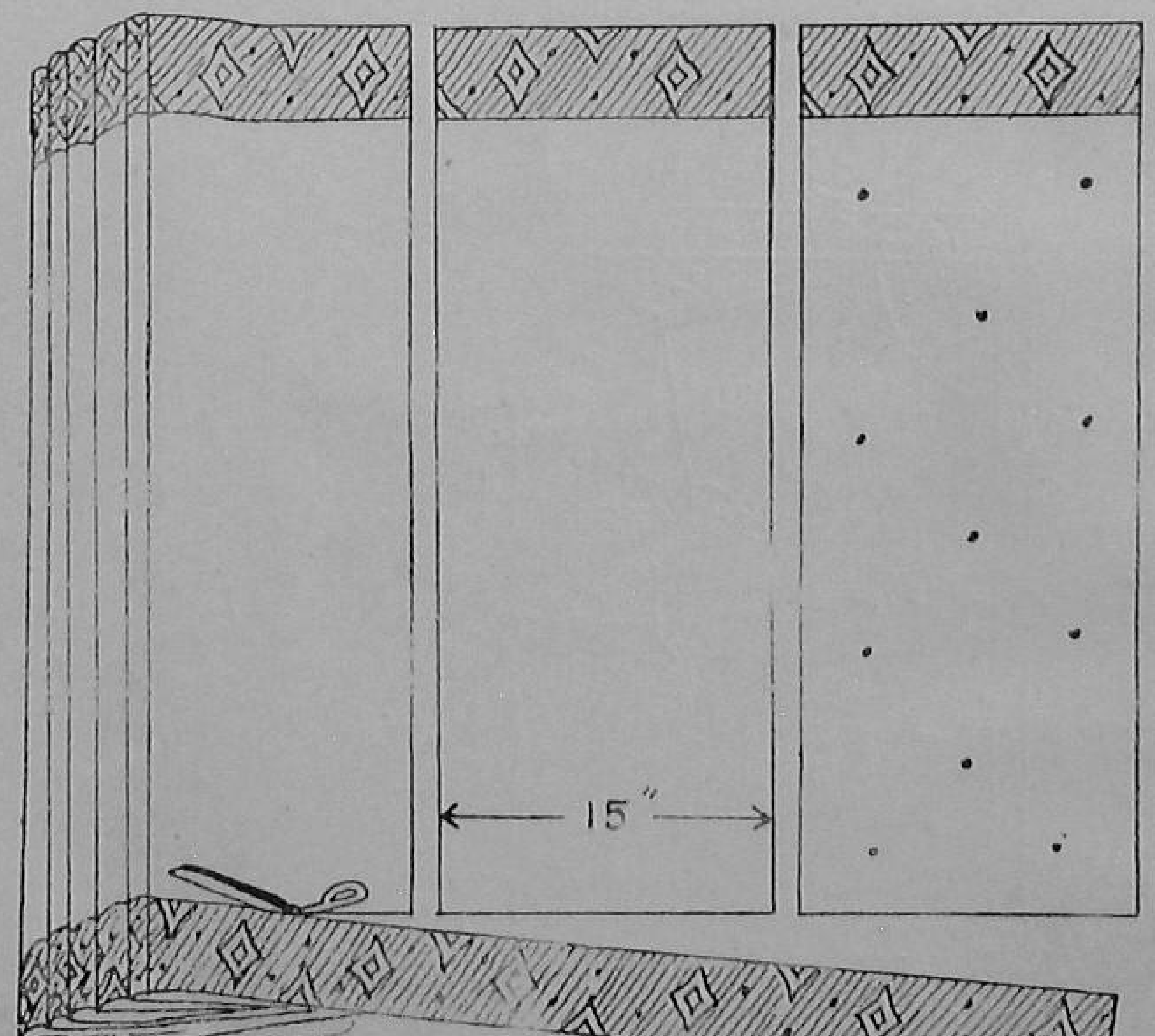


Fig. 8. Layout of the pattern pieces

HOW TO MAKE THE FROCK

Make the shoulder seams and the side seams of the bodice, leaving 3" free above the waist-line at the left side-seam of the bodice to form the side-opening. Make two darts, each ½" wide, at the back to fit the waist. Bind the slit at the front below the

Fig. 9. The saree made ready for the layout



neck with a narrow strip of the plain fabric of the saree (See Fig. 10). Attach a narrow folded piece of material just below the left side-binding of the slit to form the button-band.

Keeping the slevedge of the border as the lower end of each piece, gather the top of 'A' and join it to the lower end of 'B'; gather the top of 'B' and join it to the lower end of 'C'

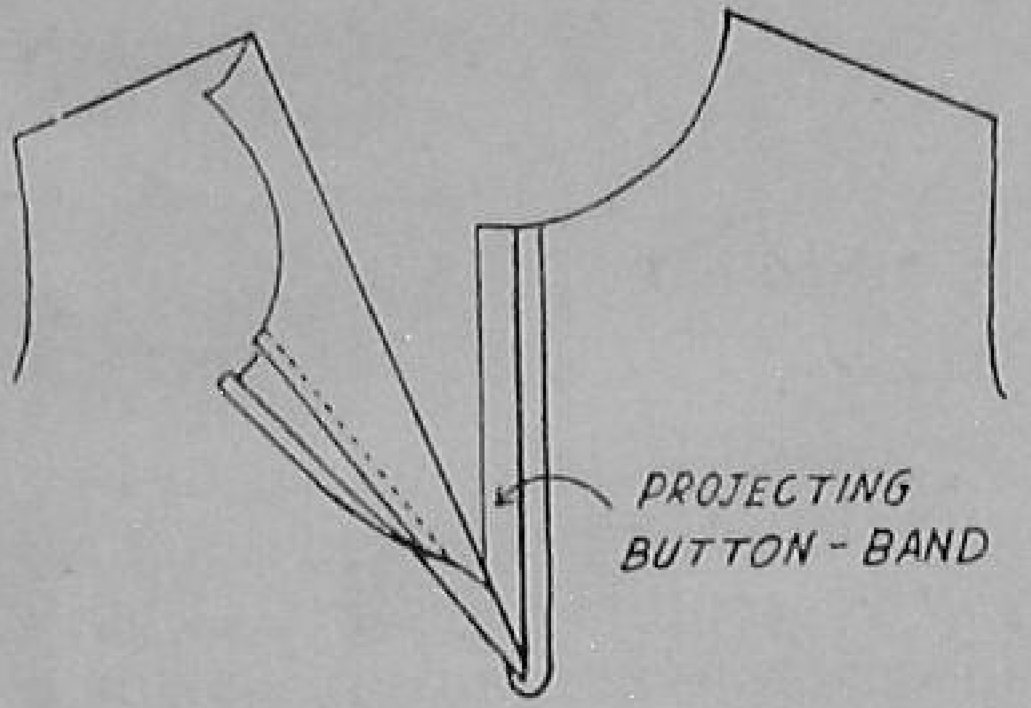


Fig. 10. Binding the slit at the front with a strip fabric

and gather the top of 'C' to fit the waist-line of the front bodice. (See Fig. 11). Prepare the back skirt in the same way with the three pieces A′, B′ and C′. Leaving 2½″ free from the left-side top C C′ to form the continuation of the side-opening of the bodice, make the side-seams of the front and the back skirts. Take care that the seams of A A′, B B′ and C C′ match.

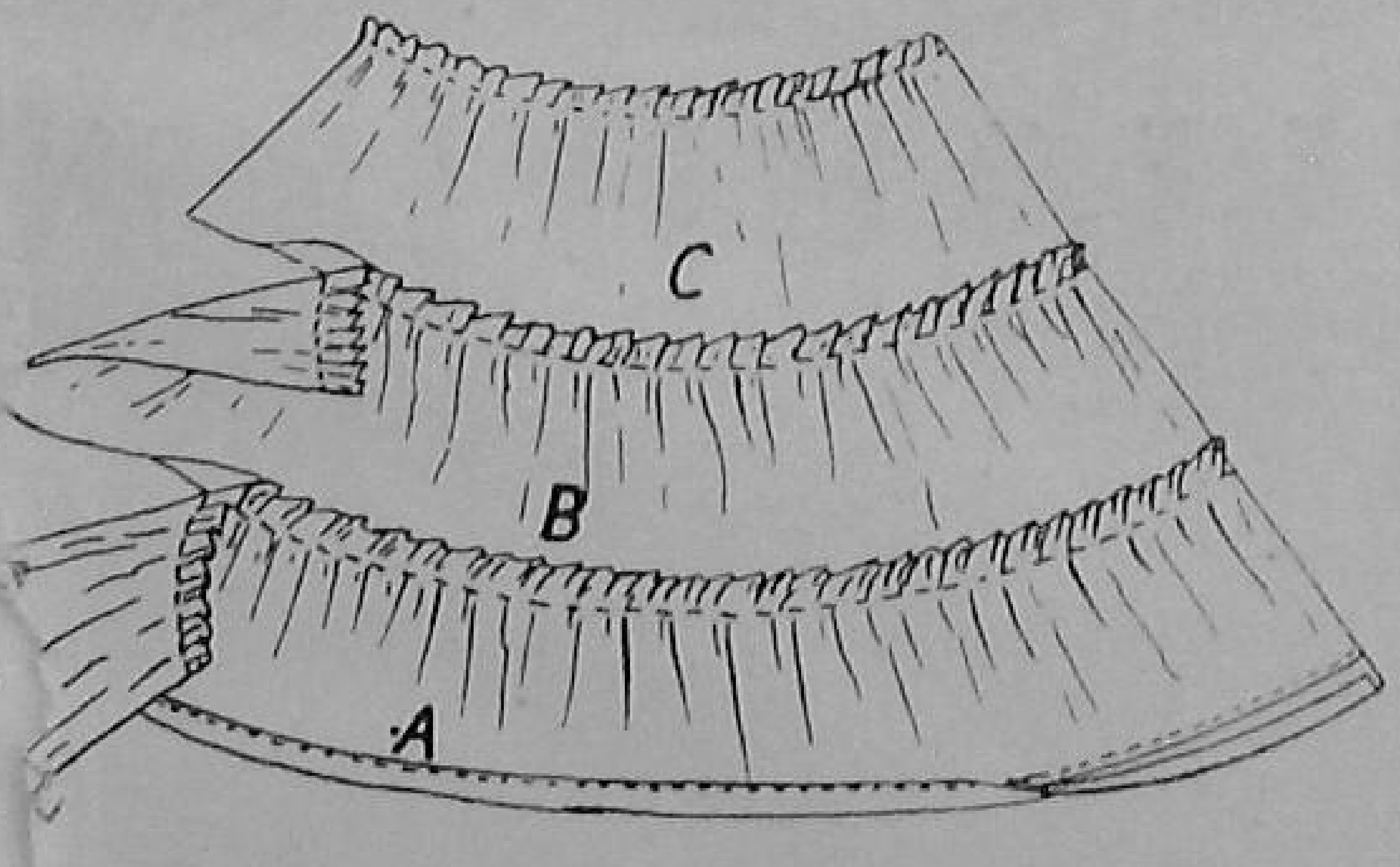


Fig. 11. The three pieces of the skirt—A, B & C

Make a narrow false hem at the lower end of the skirt. Attach the skirt to the bodice of the frock, so that the side-seams match and the raw edges of the side-opening of the bodice and the skirt are in line. Face the raw edge of the side-opening of the front and make a protruding band at the raw edge of the side-opening at the back (See Fig. 12). Place the facing over the band and secure them in position at the top and the bottom with a few invisible stitches. Sew the necessary buttons or hooks, keeping the waist-line intact.

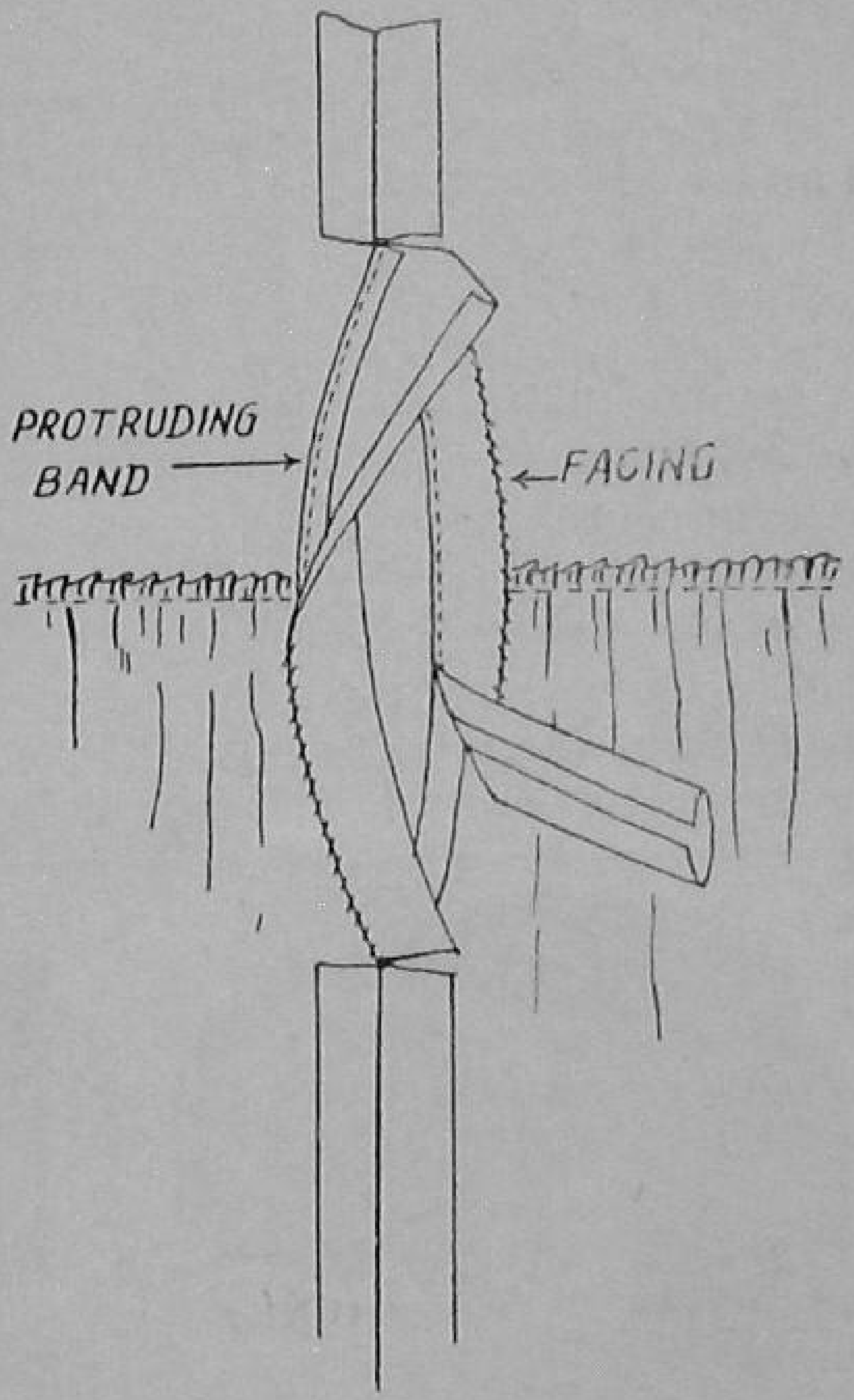


Fig. 12. Finishing the side opening

Gather the lower end of the sleeves to fit the sleeve-band and bind the sleeves. Leaving 2″ free from either end, gather the sleeve-head to fit the armhole. Make the side-seams of the sleeves and set the sleeves in the respective armholes, taking care that the portion cut deeper in the sleeve-head comes to the front of the bodice.

Place the two collars one over the other and join them along the outer edge, allowing ½″ for the seam. Turn the collar inside out and pin it to the neck of the frock, so that the

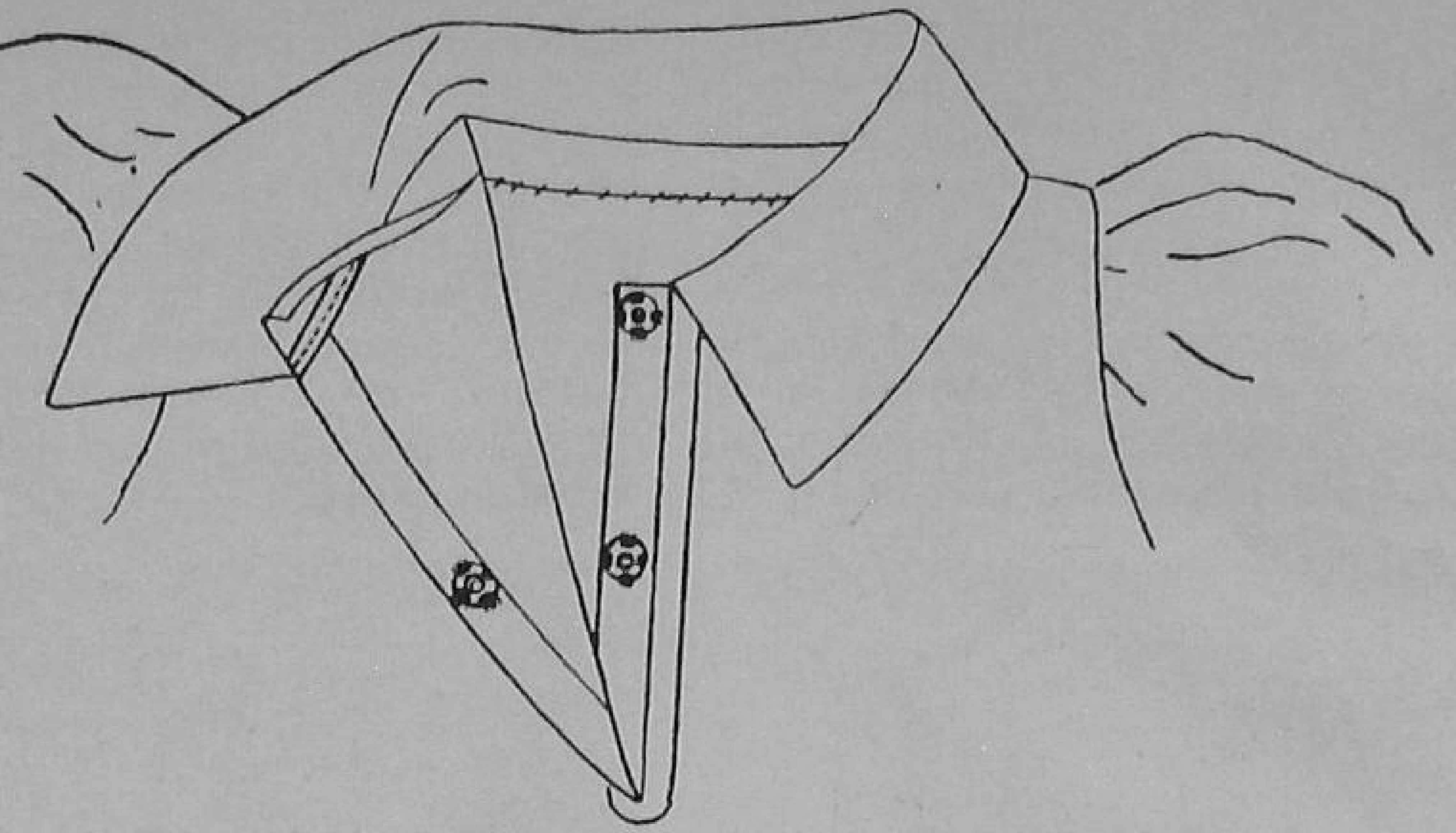


Fig. 13. Fixing the collar

neck-ends of the collar come to the outer edges of the binding of the slit and the centre of the collar coincides with the centre of the back neck. The circumference of the neck-end of the collar will be slightly smaller than that of the neck of the frock. This extra material of the neck should be adjusted neatly at the back for the good fitting of the collar. Fix the collar to the neck with bias a strip of material which should run up to the end of the button-band, fixed to the slit (See Fig. 13). Sew the required number of buttons for the front-opening and finish the frock.

The remaining part of the saree with the border can be used for making an Indian skirt, and a nice *choli* or jumped can be made from the *pallav*.

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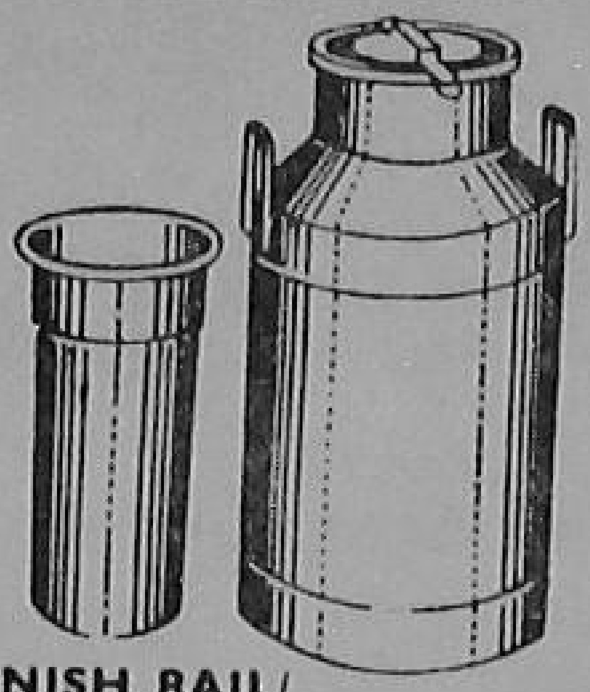
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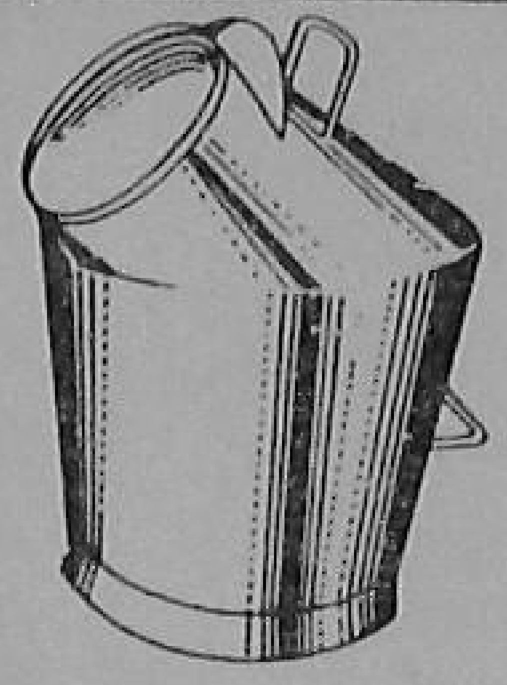
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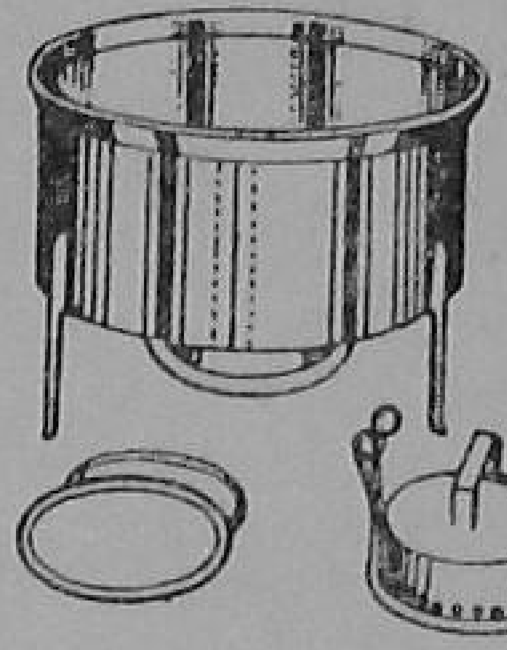
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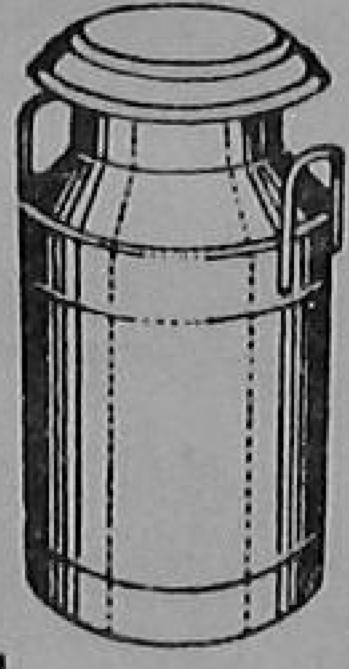
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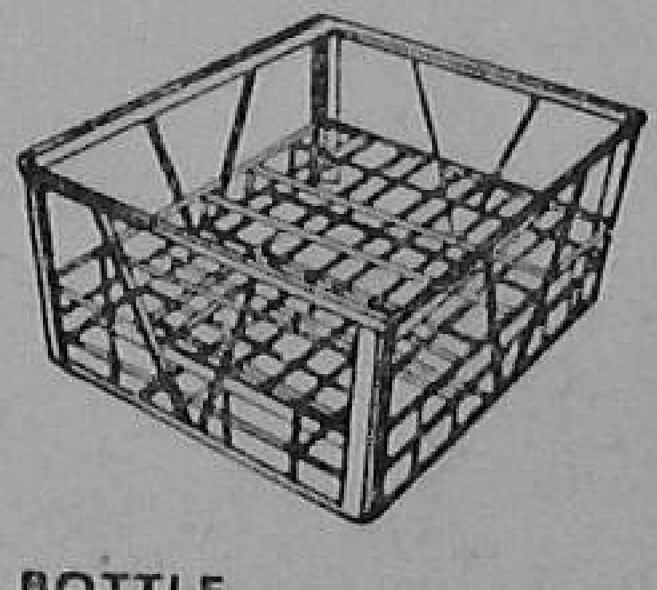
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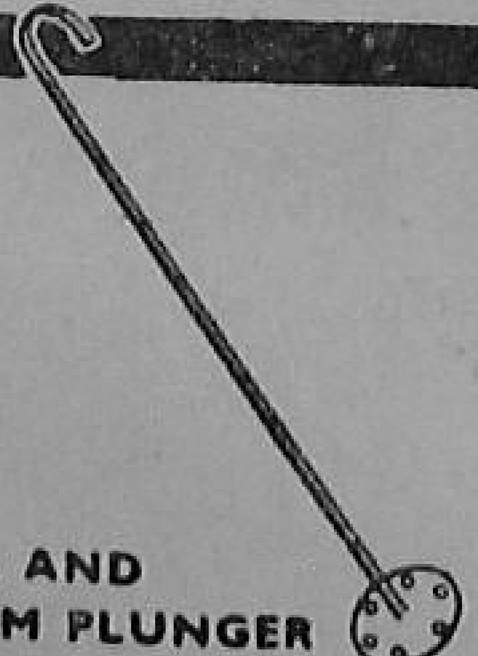
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EXTENSION

THE FARM AND FARM HOME MAGAZINE December, 1962

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The hour has come...

The Nation is in a state of emergency. It is fully determined to throw back the aggressor and defend the freedom of the Motherland.

The jawans are fighting the enemy, and will throw them back from the sacred soil of India.

But defending the country is not the job of our gallant armed forces alone. It is a job that needs everyone—man, woman and child—to do his or her duty to the country.

In this grave situation, our farmers too have to shoulder a great responsibility. They have to fight the battle on the home-front. They have to put in greater efforts to see that they get a better yield from every field. Theirs is the responsibilty to see that the country will not be wanting in foodgrains and other essential commodities, and particularly vegetables for the jawans and the people.

Our rural people, and particularly farmers, everywhere are rising to the occasion. They have shown that the nation, to a man, is solidly behind our leaders. They are sworn to throw back the enemy by doing all they can in their respective stations.

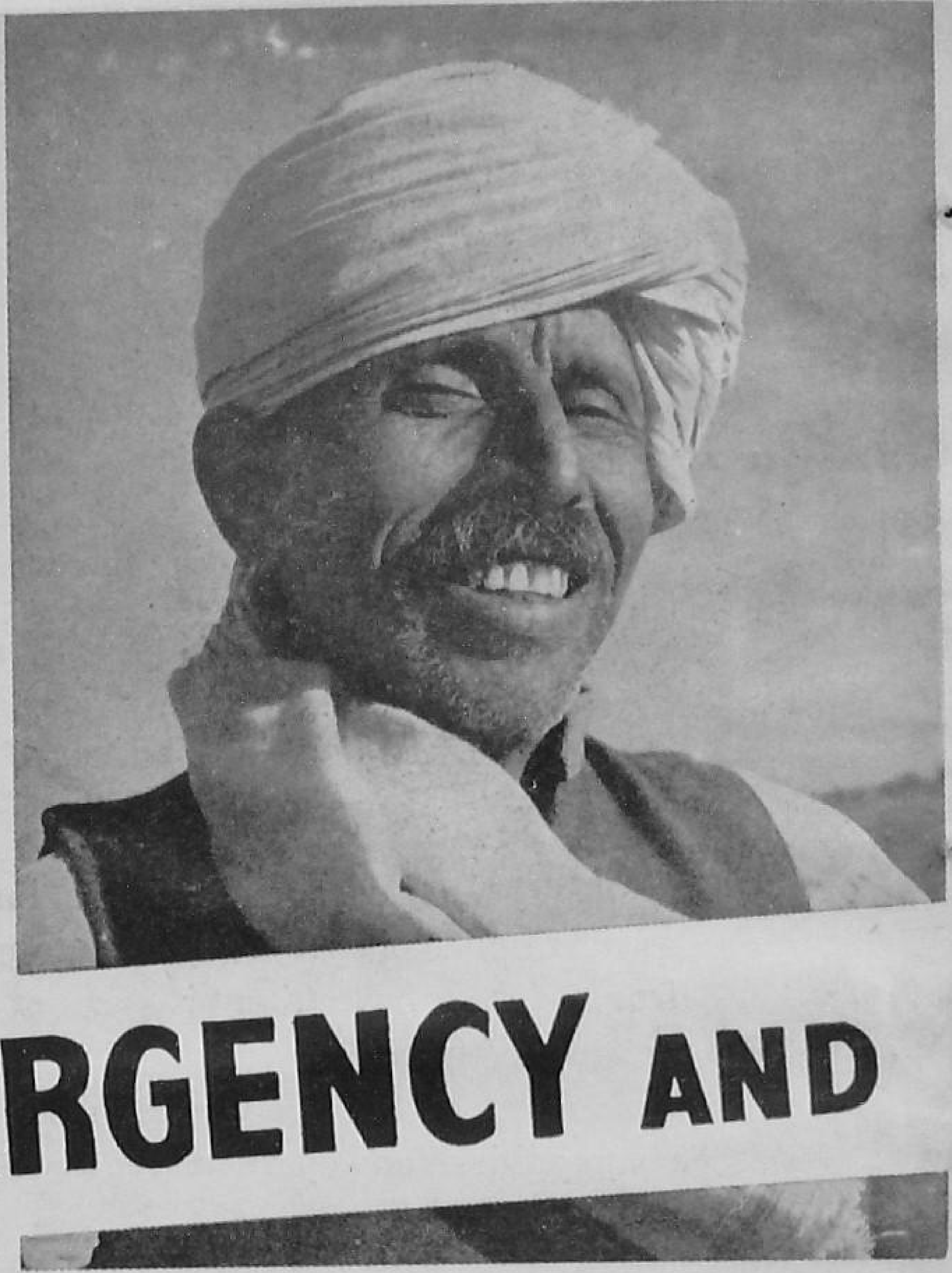
Our Extension workers too are going about their work in a missionery spirit to assist the farmers in their new duties. "Extension" too will, in turn, provide them with the information they need to fulfil their tasks ahead.

And while we all strive to do our duty, it gives us courage and faith to keep before us the Prime Minister's resounding words :

"INDIA WILL WIN"

"Our war effort essentially apart from the actual fighting done, is the effort to greater production in the field and the factory"

—Prime Minister Jawaharlal Nehru



THE EMERGENCY AND

Pandit Mulchand
"I put all my land under vegetables"

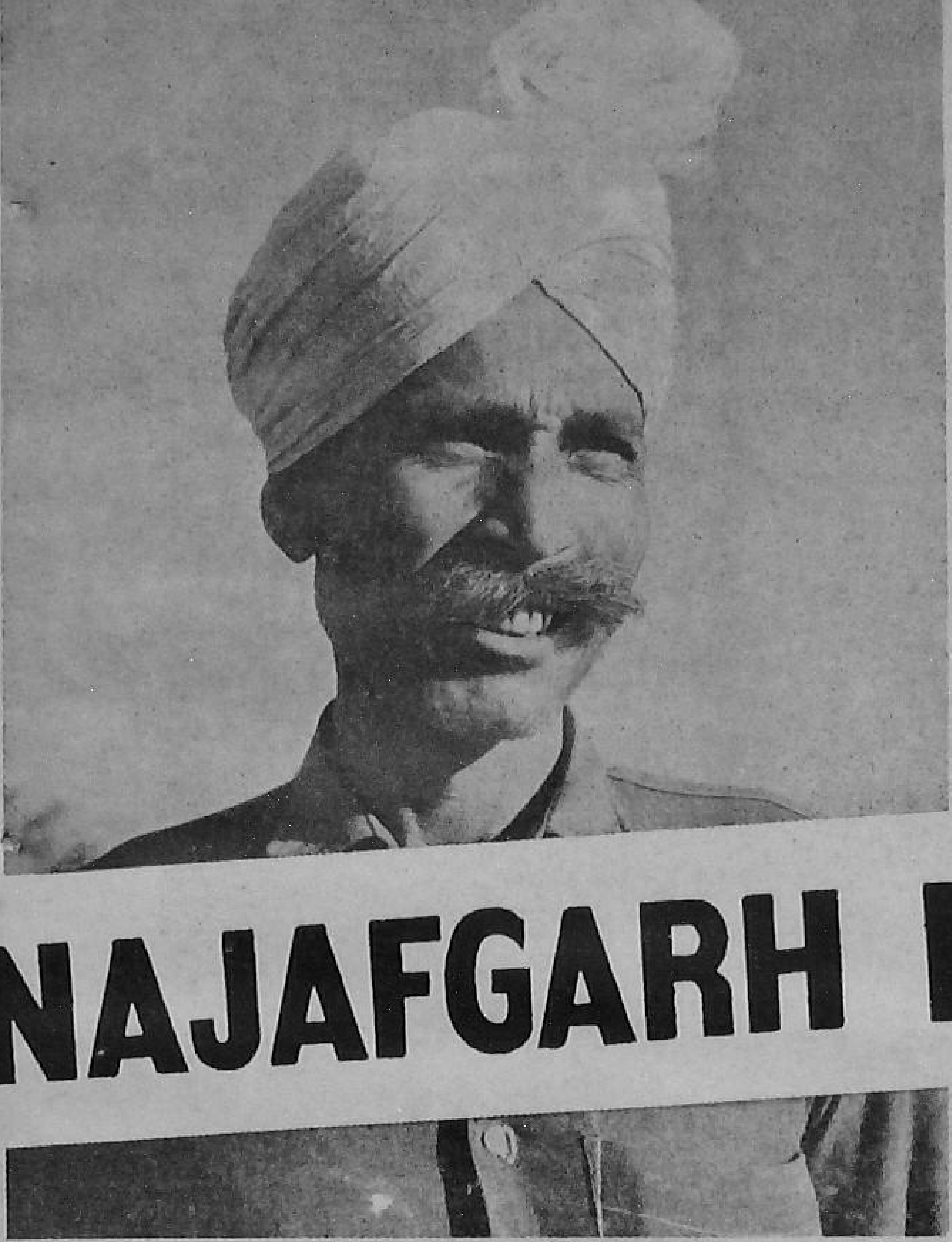
By LAL KARAMCHANDANI

WHEN the call to duty was sounded in October last and the story of contributions and sacrifices for national defence was being told all over the country, fifteen miles away from Delhi, village India was showing how determined her farmers could be in a state of emergency.

In the villages of Najafgarh Block, the people had been stirred to action. Already, one out of every five of the able-bodied had enlisted in the armed forces. Those that remained behind were set upon doing their duty on the 'home-front.'

Pandit Mulchand, a 45-year-old farmer in Kangarhedi village, whom we first met said, "I am waiting for the call to join the army, but I am afraid that my age may come in the way. But no matter where I am, I will do my best to fulfil the role expected of every farmer in this emergency. I will put in my best efforts to produce more from the land." He added, "When the call

NAJAFGARH FARMERS



Pradhan Karey Singh

"We are prepared to give everything we have"

Major Ranbir Singh

"We should work hard, produce more and spend le

came for producing more vegetables, I put all my land—4 acres—under vegetables. I shall be the happiest person when these vegetables reach the jawans on the front."

Pradhan Karey Singh of Kangarhedi village had this to say: "This village has already put a thousand extra *bighas* under wheat this time. We are growing more and more vegetables in plots, big and small, in fact in every available piece of land. All of us here realize that it is our duty to work hard and produce more, so that our country is not short of food at this critical juncture."

Karey Singh spoke for the whole village, in fact for the whole Block, when he said, "We are even prepared to give everything we have—gold, grain, labour and men—to drive away the enemy from our Motherland."

Major Ranbir Singh of Raghapur village has his own plans to meet the challenge of times. Says he, "Our farmers are

Najafgarh women in the field
"The nlace for men today—the battle-front"

coming forward to respond to the Prime Minister's call to grow more vegetables to such an extent that there is a great demand now for quality vegetable seed. My plan is to satisfy that need to some extent." He says he is going to put as much as 50 acres to growing quality vegetable seed, so that every farmer in the area wanting to grow vegetables can get the seed he needs.

But Major Ranbir Singh, who retired from the army in 1948, is not satisfied with this alone. He has some useful suggestions for other farmers too. "Those who are fit should enlist, but those who cannot, need not feel disheartened ; they too have a vital role to play—looking after the jawans' families and their fields. They should work hard and produce more, spend less and save more."

How are women of Najafgarh faring in this great emotional upsurge? To find that out, we met Sarita Devi, the young wife of Lance Naik Mukhtiar Singh of Dichion village, who is reported missing at NEFA front. We found her busy sewing garments and looking after her two young boys. And here is her reaction : "My husband is not missing. How can a person be missing when he is not found wanting in defending the Motherland ! My husband is immortal for he answered the call to fight for the country's freedom."

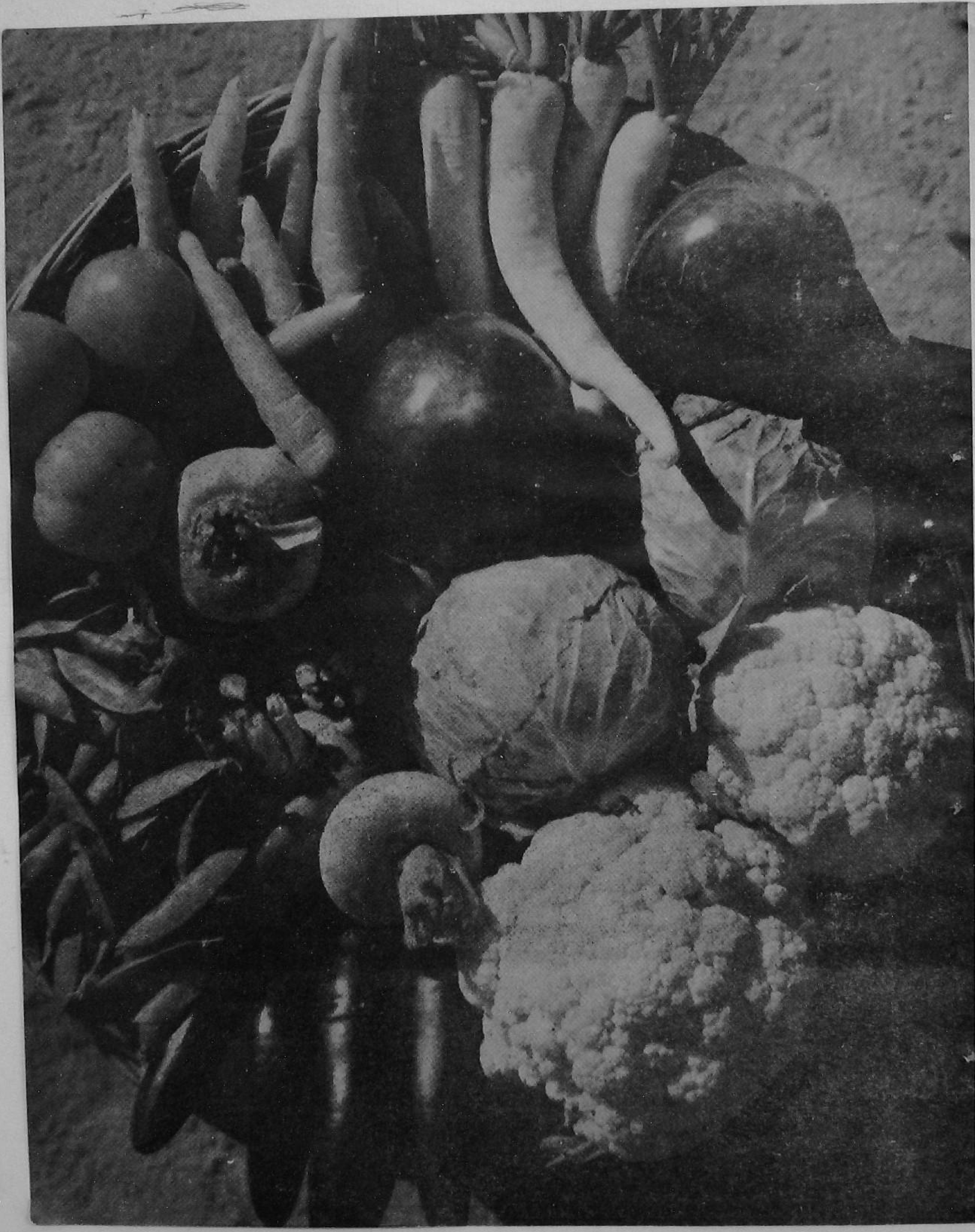
Other women too are willing to make sacrifices. They are prepared to take up the farm jobs and other chores, so that men may join the army and rid the country of the aggressors; for to men and women of Najafgarh, nothing else is more important than the freedom and honour of the country.

HARVEST HINTS ON WINTER VEGETABLES

CAULIFLOWER

A GOOD cauliflower head should be solid, compact and white. To get a white cauliflower head, break one or two outer leaves and cover the head with these leaves two or three days before harvesting.

Harvest the cauliflower **only** when it has developed well, i.e., when the head is still compact and not broken apart. While harvesting, cut the cauliflower well below the head ; trim those portions of the leaves which come above the head. The stubs of such leaves will protect the head from injury when it is carried to the market.



Do not go in for the big size only. The condition of the curd is a better guide than the size, for harvesting.

Harvest your cauliflowers either in the evening or early in the morning, so that they may be protected from the heat of the sun while being taken to the market.

CABBAGE

HARVEST only such heads as are full and hard. Do not remove those heads which are still soft. If for some reason you are unable to harvest cabbages at the right time, you can prevent their bursting or splitting by deep cultivation or twisting the plants or raising them slightly up without actually digging them out. By this operation, the roots are broken and the plants will be unable to absorb moisture; the heads will not burst. Harvest your cabbages early in the morning.

GET
A BETTER YIELD
FROM
EVERY FIELD

RADISH

HARVEST radish when the roots are still tender and crisp. Pull it out with its leaves and wash it to remove the soil. The fresh white appearance of the roots with the green leaves will get have a ready market.

TURNIP

HARVEST turnips when they are three to four inches in diameter on the upper side. If you allow them to grow bigger, their quality suffers. Harvest turnips in the evening.

CARROT

HARVEST carrots when they are 1 inch to 1½ inches in diameter at the upper end. If you have planted them on flat beds, remove the tops close to the ground and dig them up with a spade. If, however, you have grown them on ridges, pull them out with their tops after loosening the soil with a spade. Remove the leaves and wash them clean. Cut the side roots before you take them to the market.

PEAS

HARVEST peas when the pods are well filled. See that the peas inside are tender and are becoming light-green in colour. Do not injure the plants while you pick the pods, for then they will stop bearing new pods.

TOMATOES

If you want to pick tomatoes for your home use, do so when the fruits are red or pink and firm. If you want to market your tomatoes, pick them a bit early when they start turning pink. If the market is a little away, it is better to pick them when they are still green but fully developed. While picking tomatoes, avoid injury to the stem or fruits.

THE BARWALE'S WAY OF MAKING MONEY WITH **IMPROVED BHINDI SEED**

By L. VENKATARATNAM

PUSA *SAWANI*, an improved variety of *bhindi*, is helping Shri Badri Narain Barwale of Jalna village in Aurangabad District of Maharashtra State, earn a very good income. He raises the crop for seed and sells the seed to other farmers.

Pusa Sawani, evolved at the Indian Agricultural Research Institute, New Delhi, is a variety which is not harmed by the leaf vein mosaic disease. Apart from this, *Pusa Sawani* is also a good yielder. That is why there is a good demand for its seed throughout the country.

Shri Barwale came to know of this variety when he visited the World Agricultural Fair held at New Delhi two years

Shri Barwale takes good care of his crop by protecting it against pests and diseases

back. He realized that *Pusa Sawani* could be a good money-earner for him.

He brought one kilogram of *Pusa Sawani* seed and started his seed-farm. Today, he has 14 acres under *Pusa Sawani* seed-crop, giving him 6,000 kilograms of seed.

Every care is taken by Shri Barwale to produce high quality seed. He applies 13 cartloads of cattle manure and four hundred-weights of superphosphate per acre. He also top-dresses the crop with ammonium sulphate at 1/4 ounce per plant.

He raises his crop in lines, two feet apart. In the first week of July, just after the first shower, he dibbles two seeds at each hill spaced one foot apart.

He takes all the precautions to keep the pests and diseases away. He sprays his crop with a solution containing 1 ounce each of 'Endrin,' wettable sulphur, and a copper fungicide diluted in 4 ounces of water. He gives about 8 to 10 sprays till the pods mature.

When the plants have nine pods on each, he pinches off the growing tips of the plants and thus hastens the maturity of the pods.

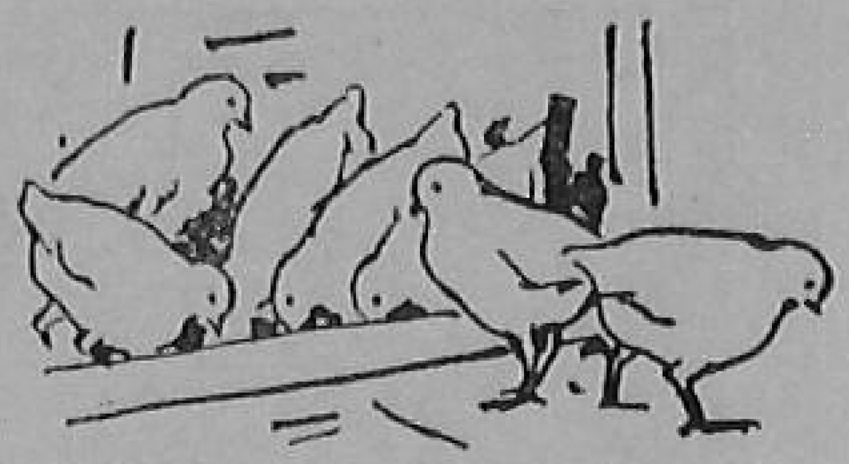
In about 110 days, the crop is ready for harvest. When the pods are completely dry (the germination will go down if the pods are not completely mature) he picks the pods, and gets them dried and split.

To select plump and healthy seeds for sale, he floats the seeds and takes only those that sink to the bottom. He stores the seed only after drying them well.

This is how Barwale's luxuriant *Pusa Sawani* crop looks at the podding stage

Shri Barwale's *Pusa Sawani* seed-farm has proved to be a big success and is very popular with the vegetable-growers.

Try DRY VITAMINS IN YOUR POULTRY FEED

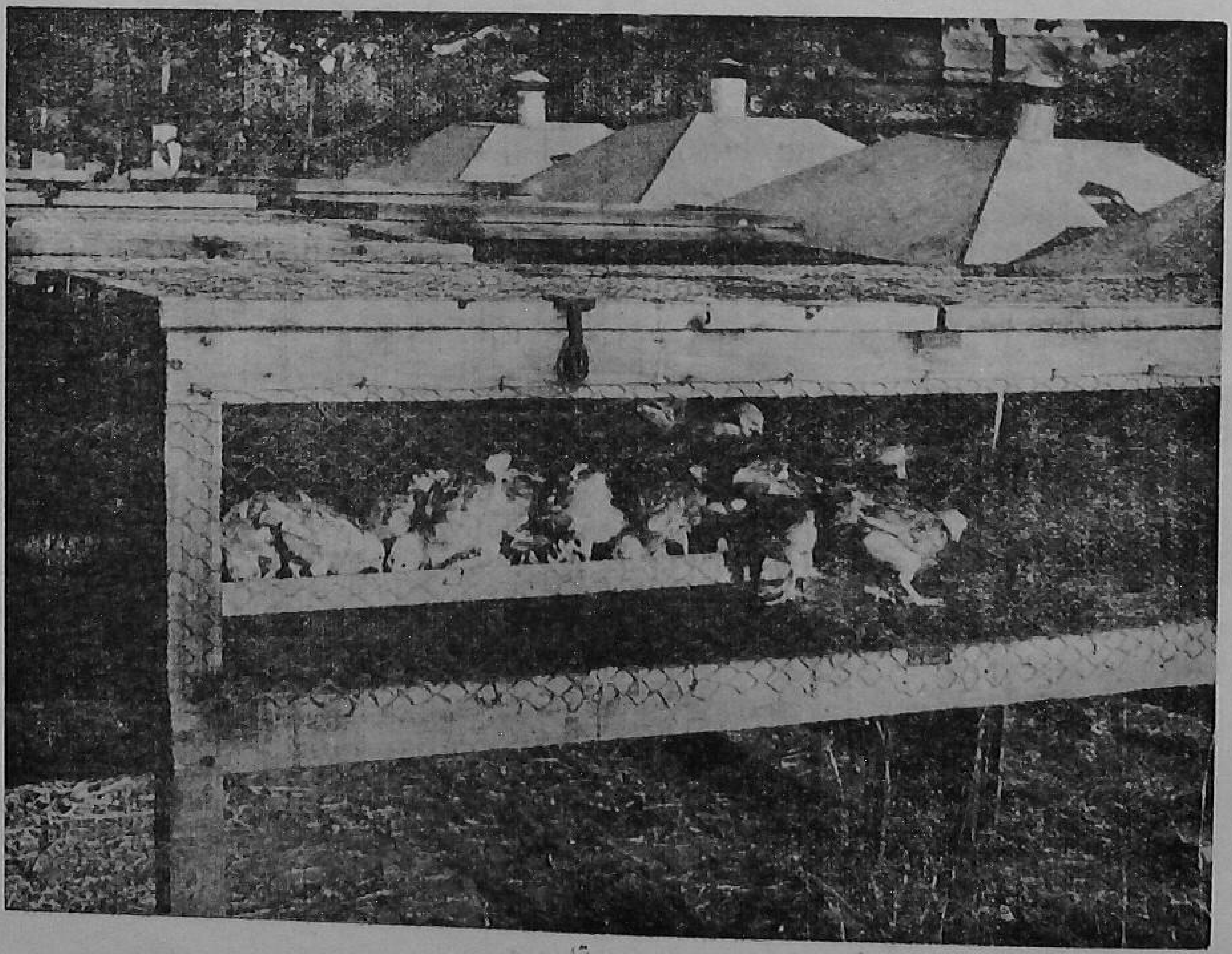


By N.S. GAREWAL and S.G. IYER

To a good poultry-keeper a well-balanced poultry feed consisting of carbohydrates, proteins, fats, minerals and vitamins is a costly item on the expenditure. For the cost of feed alone comes to as much as 60 per cent of the total cost on the upkeep of birds. You, as a poultry-keeper must, therefore, be wanting to cut down on the feed expenses without of course impairing the health and efficiency of the flock.

The cereals and their by-products together with the vegetables and animal proteins that you normally feed to your poultry, do not,

Poultry birds raised in confinement need to be provided with vitamins in their diet



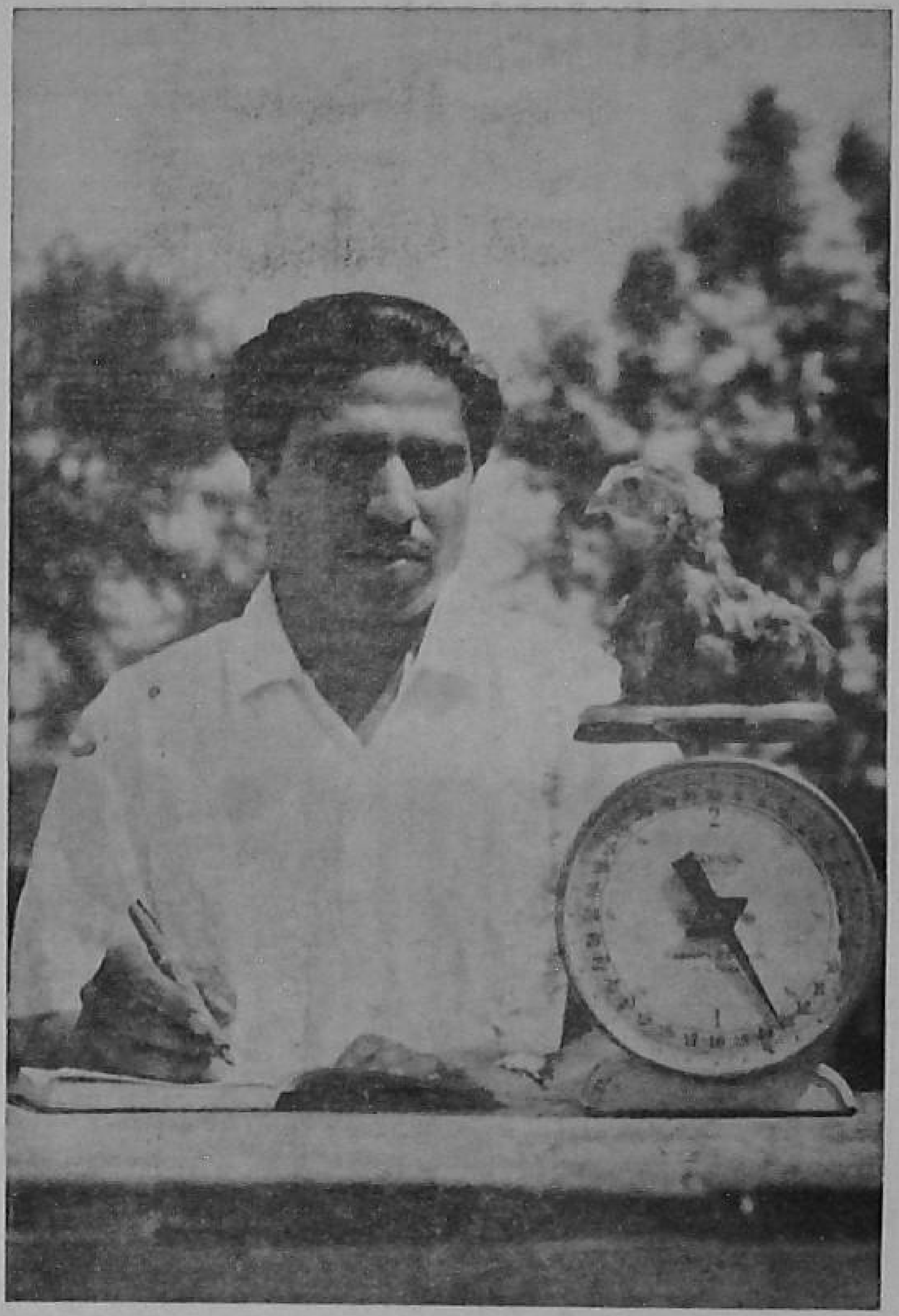
however, provide enough vitamins to your birds. Vitamins, therefore, have got to be supplemented in the ration.

If you are keeping birds on range, they can secure most of their vitamin requirements from green grass and sunshine. Sunlight provides them with enough of vitamin D-3. But if you are rearing your birds confined to houses, they will not get sufficient sunlight. So you are to feed them with shark-liver oil. To supply Vitamins A, B1, E and B2 you may give berseem or lucerne in green or dry form. However, if you want good quality eggs from your birds and are anxious to avoid cold or other common diseases of the wind-pipe in your birds, you must feed them with greens.

The modern method, however, is to feed all-mash ration to your poultry which has come into a wider use because of its great simplicity. But even to the all-mash ration, you must add the vitamin supplements.

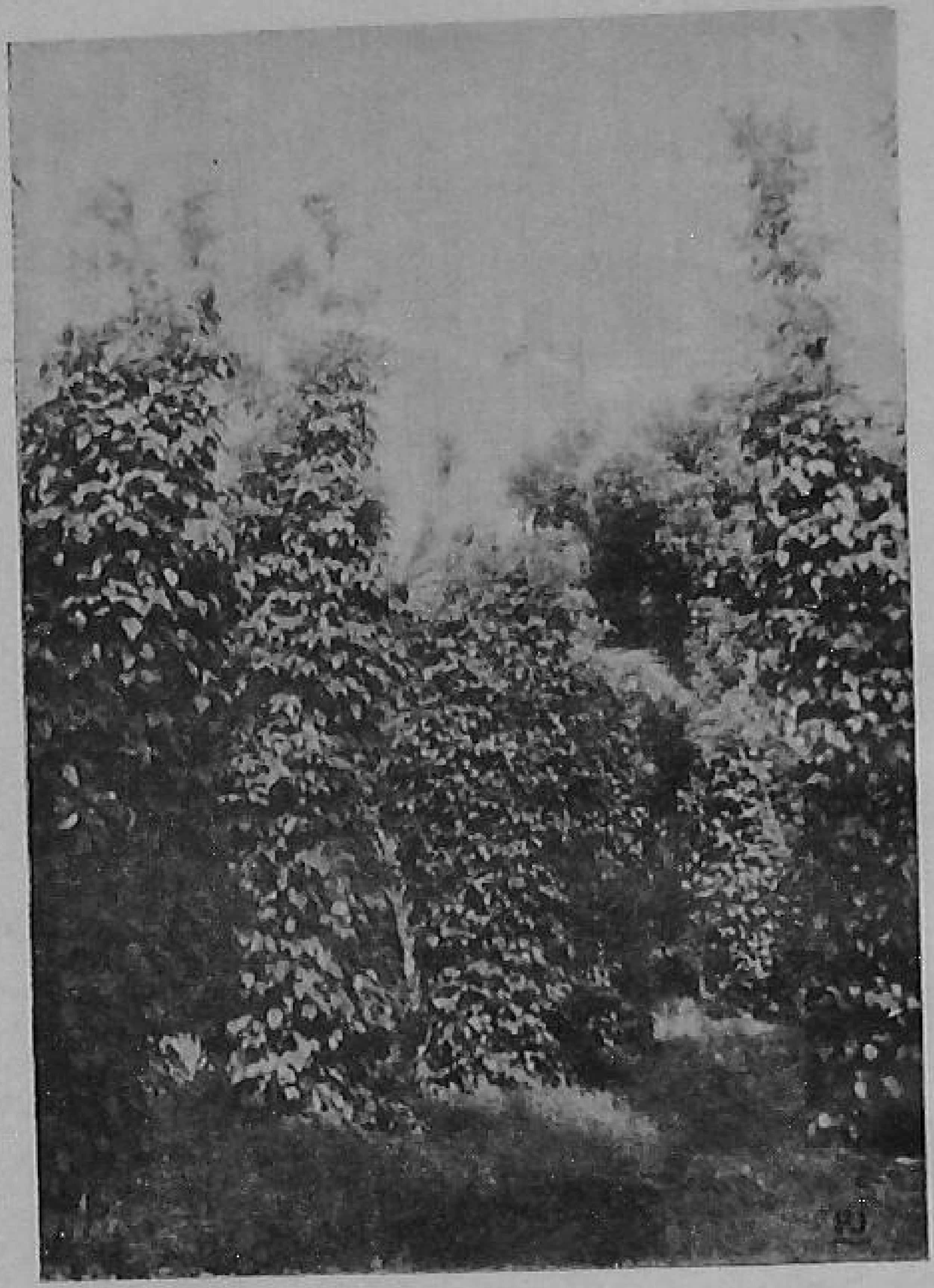
Green feeds and veterinary grade shark-liver oil are of course a very good source of Vitamins A and D3. If fresh greens are available, there is no need for any substitute, as these are a good source of different vitamins. They are quite cheap too. But then, greens may not always be readily available, as is the case in summer. The shark-liver oil also turns bad if not properly stored. Moreover, it is costly and thus increases the feed-bill. So the provision of essential vitamins for your birds is a real problem to many of you.

Here is where the dry vitamins come in. Experiments were conducted at the Government Model Poultry Farm, Delhi, to find out how the feed containing dry Vitamins A and D-3 compared with the feed containing shark-liver oil. It was found that the birds fed with ration to which dry vitamins were added, gave a good number of big eggs and grew well. Such a dry vitamin supplement was nearly 82 nP cheaper for every hundred pounds of mash as compared with shark-liver oil ration. Dry vitamins, therefore, are a very good substitute for the green feed and shark-liver oil. So why not try dry vitamins in your poultry feed this time !



Birds fed with a dry-vitamin-ration grow well

GLYRICIDIA—A SUITABLE SUPPORT FOR PEPPER



By C. A. THOMAS

GLYRICIDIA gives a good green manure, makes a nice shade-plant for tea or coffee and is excellent as a support for pepper vines.

Farmers who have used glyricidia as support for pepper say that by training pepper on glyricidia they are able to raise their pepper-profits.

Glyricidia, being a quick-growing plant, stands frequent loppings well. Its foliage also can meet the manurial needs of the vines to some extent. It grows to a height of 15 to 20 feet in about three years.

Glyricidia is a complete organic manure. Its leaves contain nitrogen, phosphoric acid and potash.

Glyricidia can be grown on any soil and is especially good for growing on hilly slopes. It is very easy to grow too. Plant the cuttings and you won't have to take any special care afterwards. The only thing you have to do to make it suitable as a support for pepper is to prune it regularly.

Begin prunning when the plant is about six feet in height. Cut off the lateral branches growing from the lower sides, leaving only

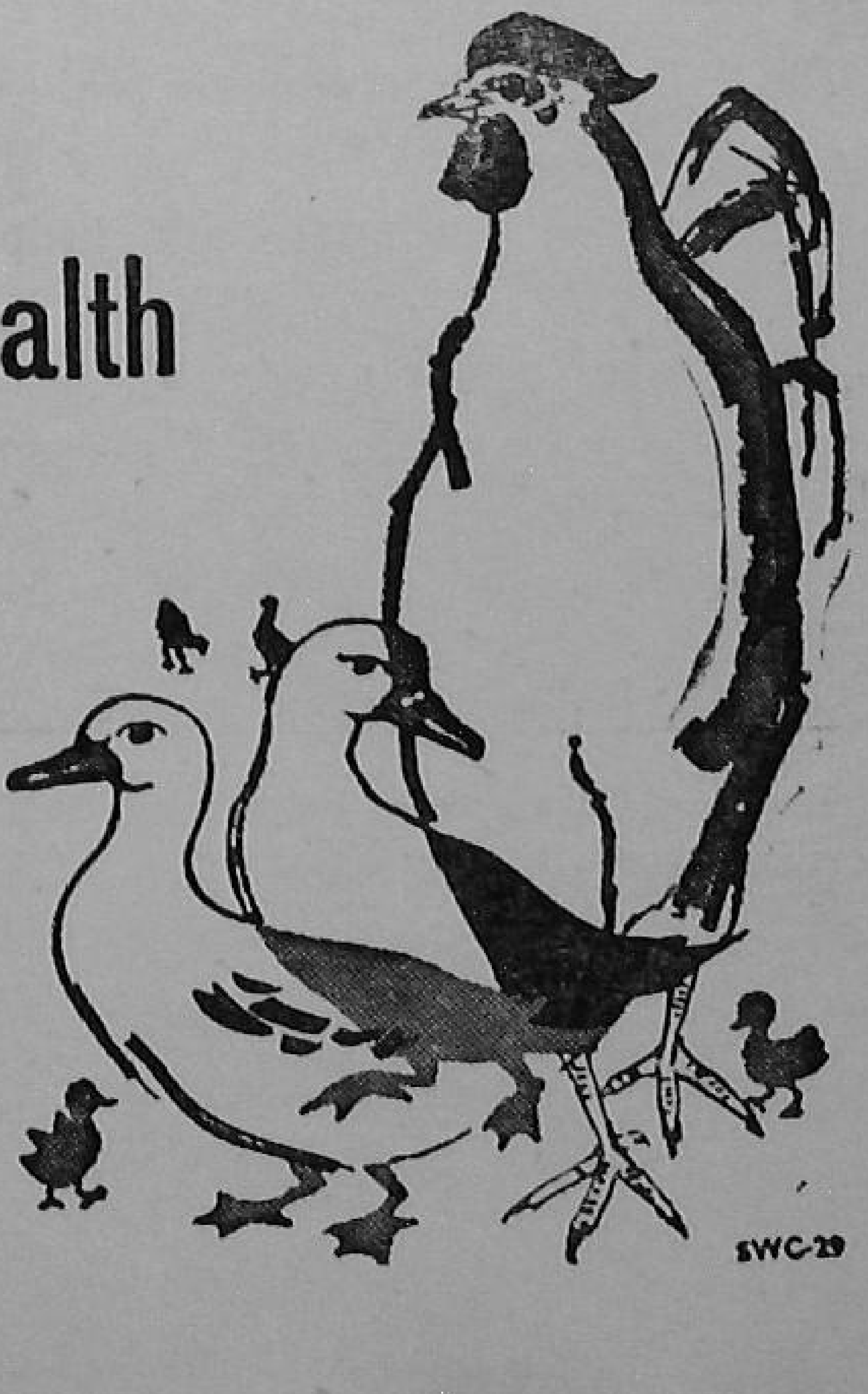
two healthy branches to grow. Better top these branches to prevent the plant from becoming too high and getting uprooted due to strong winds. Repeat the pruning this way till the plant reaches its full height. You can use these pruned branches for raising a new plantation.

As the stem of glyricidia is smooth, very often the vines get detached from the plant. Hence, you have to tie the vines regularly to the stem to prevent them from loosely hanging or falling down from the standard. You have to do this right from the time when the vines get established till they reach the top of the stem. When the vines grow and spread over the branches, they cling on to the support quite firmly with their roots and hence the tying up is not required.

Because of its many advantages, glyricidia is becoming popular as a standard for pepper vines now.

In Kerala, glyricidia has become quite popular as a support for pepper

keep your poultry in good health



Keep your poultry in good health and promote growth and egg production with 'Star' Brand Poultry Mineral Supplement which contains essential minerals and vitamins such as Calcium, Phosphorous, Manganese, Vitamins A, B_2, D_3 etc. which are often deficient in poultry foods.

The addition of only 3% of 'Star' Brand Mineral Supplement to poultry feeds will produce a product conforming in mineral and vitamin contents to Indian Standards Institution specifications.

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THE 'PACKAGE' COMES TO BISHANPURA

An Agricultural Extension Officer tells Jayaram Tiwari and two other progressive farmers how 'Pakage Programme' can help them in better farming

NO ONE visiting Bishanpura village in Shahabad District in Bihar can miss meeting Jayaram Tiwari, a hardy farmer in his early forties. And he has a story to tell.

As you move along in the village and meet other farmers, including Kirtyanand Tiwari, the village Mukhiya, the story is repeated. The theme of the story is, 'Since the last year, we farmers have had a new future opened up for us.'

The year before signifies the year the village was brought under the Intensive Agricultural District Programme, or the 'Package Programme' as it is popularly called. Shahabad is one of the first seven districts in the country to be brought under the Programme.

And the Programme, to Jayaram and the other farmers—twenty of them of the forty-two in the village—was a year of education in better farming and higher income.

NEW CROPPING PATTERN

The Package Programme staff that visited the village instilled in these farmers a new idea of cropping. They impressed on them that

instead of the traditional wheat and gram mixture in *rabi*, they should grow pure crops of irrigated wheat and gram, and in *kharif* they should raise an early potato crop followed by onions and maize. This the farmers did, and found that they had more yields and their income almost doubled. For the first time, these farmers learnt to plan their cropping system.

MORE FERTILIZERS

In the previous years they had used but a small quantity of ammonium sulphate for their irrigated *kharif* paddy. They were now told of the utility of 'balanced' fertilizer for crop growth, and were helped to get the fertilizer, and also shown the method of using it.

Fertilizer consumption almost doubled within a year in the District. There was a greater use of phosphatic fertilizer—almost six times than that in the previous year. The use of fertilizer mixture and potash which was hitherto unknown in the area, was taken up by the farmers for the first time.

EASY CREDIT

The Multipurpose Co-operative Society of the Bibiganj village enrolled these farmers as new members, and helped them with the credit needed for purchasing their seed and fertilizers.

HIGHER YIELDS

Jayaram Tiwari was one of those who harvested a 26-maund paddy crop (as against 10 maunds he obtained only a year earlier) and 300 maunds of 'Up-to-date' potato as against the usual 100 maunds of the local variety.

OTHER VILLAGES TOO

The story of Bishanpura is typical of what is happening in the 2,000 villages that have come under the Programme in the Package District of Shahabad. Today, over 35,000 farm families are actively participating in the Programme.

SEEING IS BELIEVING

The Intensive Agricultural District Programme lays special stress on demonstrations. It has proved to be a good method of convincing farmers about the superiority of improved crop practices over traditional agriculture. Last year, 1,455 such demonstrations on paddy, 1,499 on wheat and 1,417 on other crops including potatoes were laid out in the District.

IMPROVED PRACTICES

The use of better seed—the first step in inproved crop production—went up as never before in the District. Supplies of improved wheat seed alone jumped up to 4,560 maunds in 1961-62 from 1,517 maunds in 1960-61, and seed potato to 3,850 maunds from 485 maunds.

The advantages of soil testing have also caught the imagination of Shahabad farmers. Many of the farmers had their soil samples taken for analysis, so that they could know how best they could manage their soils. Nearly 1,860 such soil samples were taken and 614 of these were tested. Recommendations based on these were passed on to the farmers concerned.

Crops on all farms received better protection from pests and diseases. Consumption of pesticides rose from 13,200 pounds in 1960-61 to nearly 52,000 pounds in 1962.

Credit, an important need for increased farm production, was available to farmers in a greater measure. In 1961-62, Rs. 27 lakhs were advanced as short-term loans (it was about Rs. 8 lakhs in the previous year) and Rs. 6 lakhs as medium-term loans (against Rs. 2.2 lakhs in the previous year).

Seventeen new marketing societies were formed to deal with the marketing of farm produce. Similarly, to store supplies and produce, 35 new godowns were under construction in addition to the 23 already constructed and 31 taken on hire.

The Package Programme has, as in Bishanpura, brought in a new note of confidence among farmers about what they can do by way of improving their farm production and income. As Jayaram Tiwari said, "They have shown me the way. I am now convinced that with improvements, I can earn much more from my 4½ acres than I ever thought I could."

Farmer Jayaram Tiwari knows that weeding is as important operation as any in maize cultivation

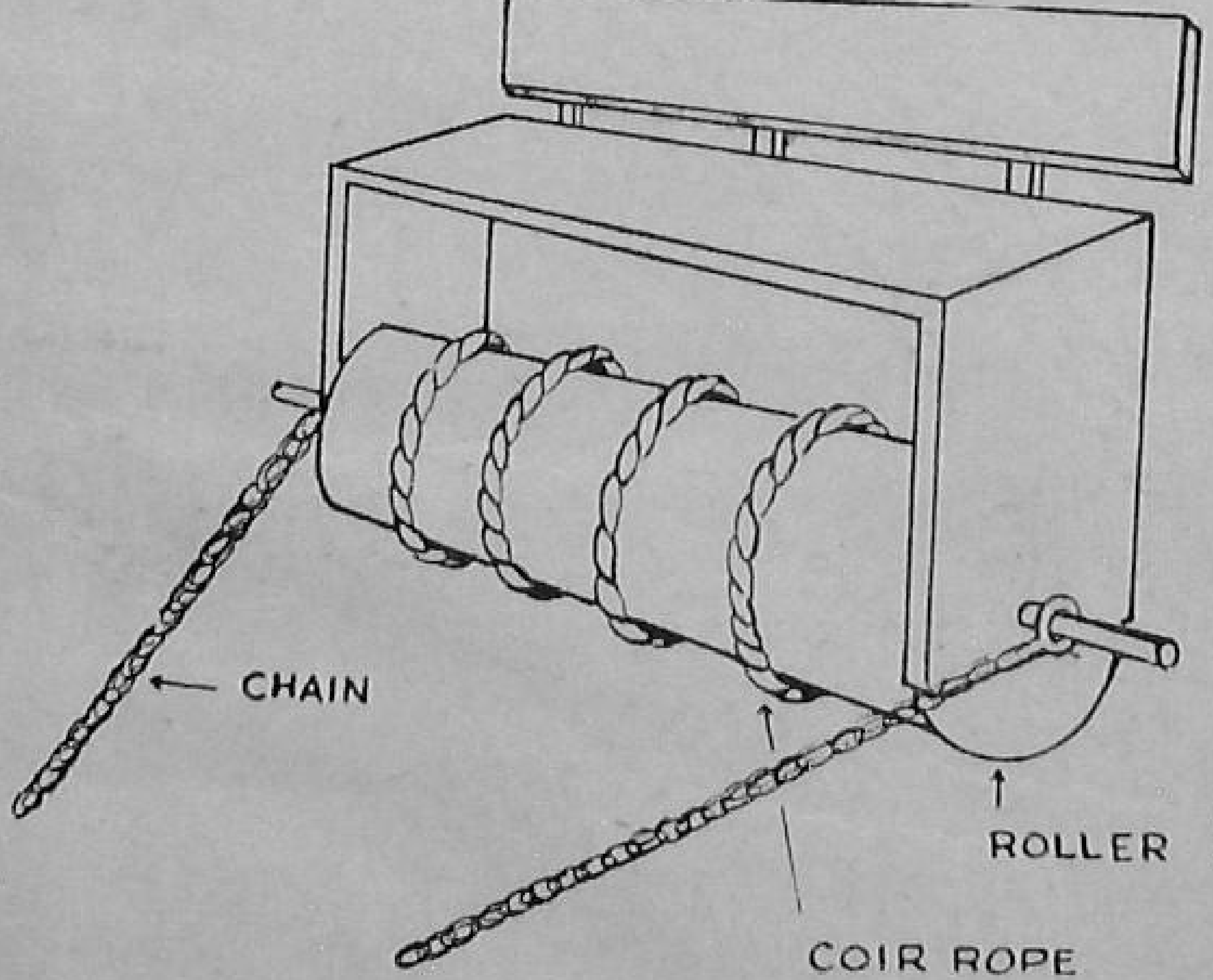
THE

Newer Implements FOR THRESHING AND WEEDING PADDY

By D. N. KHERDEKAR

THRESHING ROLLER

FOR the last two years, many farmers in Raipur (Madhya Pradesh) are using a new implement for threshing their paddy.



Threshing roller

This new implement—a threshing roller—was designed by the Agricultural Department and is an answer to the farmers' demand for a simple bullock-drawn thresher for paddy.

Costing about Rs. 80 to 100, this implement has proved a big success. However, the threshing roller is being further improved to make it suitable for use all over the country.

RAIPUR PADDY WEEDER

From Raipur comes another new implement—Raipur Paddy Weeder. The weeder is useful for working on light soils.

The construction of this weeder being simple, it can easily be made by a village blacksmith or carpenter. It costs ten rupees.

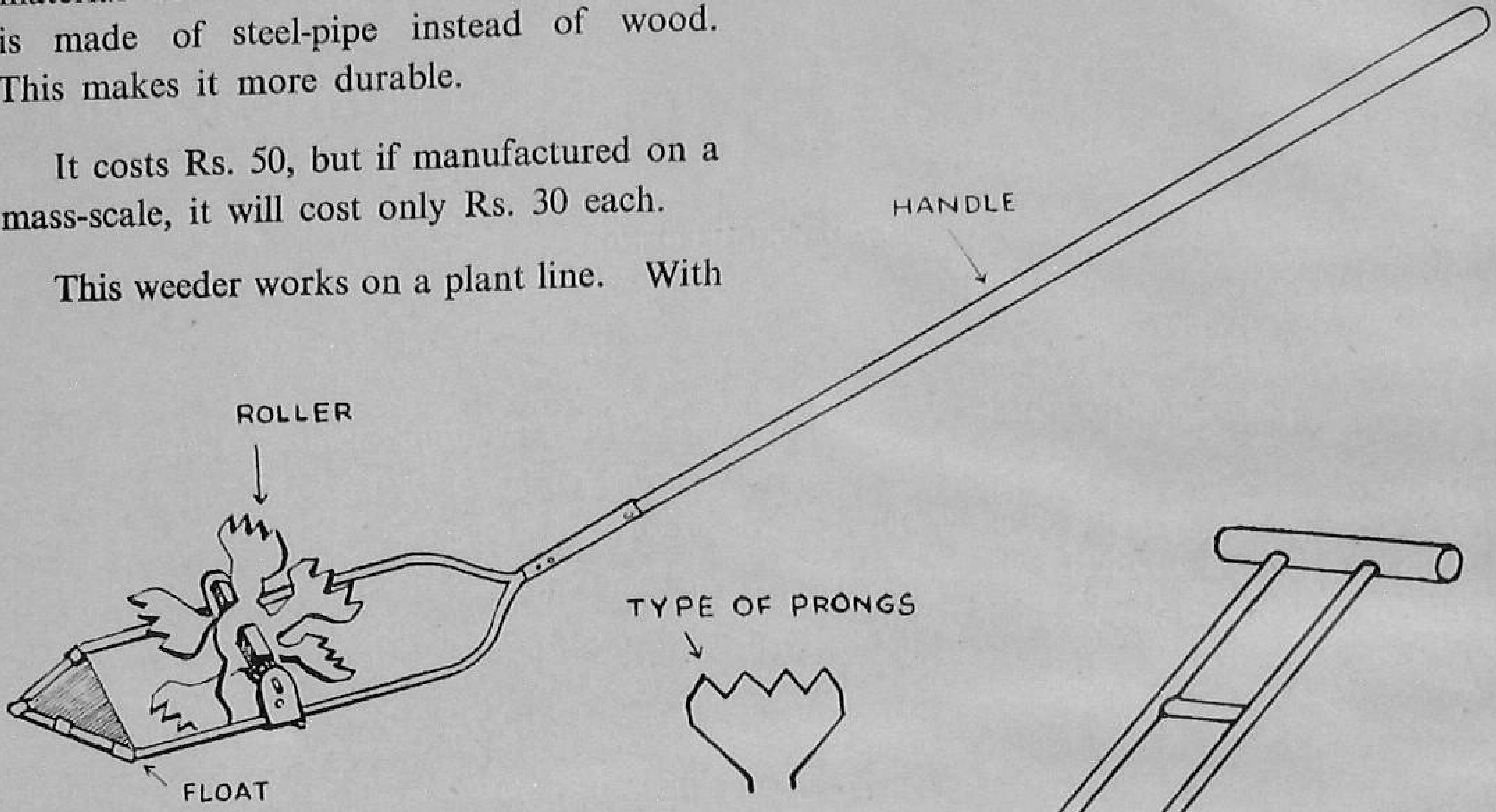
DRUM-TYPE WEEDER

For weeding paddy, another new implement is now being manufactured, though on

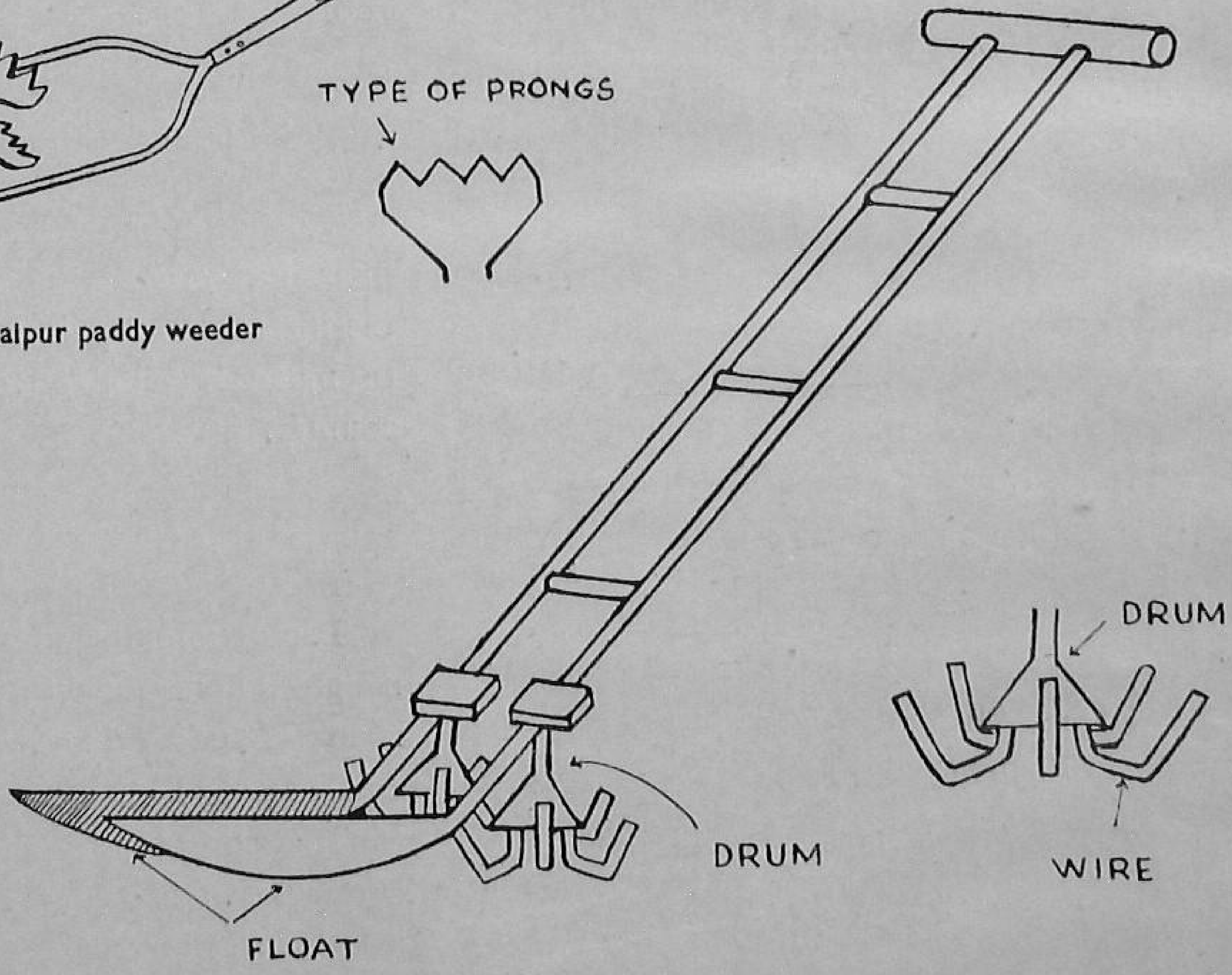
a prototype basis. Known as Drum-type weeder, it is designed after the Japanese type weeder. The difference is only in the material used for its construction. This one is made of steel-pipe instead of wood. This makes it more durable.

It costs Rs. 50, but if manufactured on a mass-scale, it will cost only Rs. 30 each.

This weeder works on a plant line. With it, one can stir the soil very close to the plants without the fear of uprooting them. In fact, it does the work as good as your hands can do.



Raipur paddy weeder



Drum-type weeder

Japanese paddy farmers who came for experimenting the Japanese technique of paddy cultivation the Indian soil in Saharanpur, Uttar Pradesh, claim that by using this weeder they could get more tillers than by using a weeder which works in-between the rows.

This paddy weeder is to be used alternately with the one that works etween the rows.

THE RIGHT THINGS TO DO FOR PESTS AND DISEASES OF POTATO

By D. B. REDDY

NOW is the time to be extra watchful of your potato crop. Potato yields will go down badly when pests or diseases attack the crop. Here are some tips that will help control the important pests and diseases of the crop.

If your crop is at an early stage of its growth, you may find small, brown to almost black, and more or less circular spots appearing on the lower leaves. In the older spots, you may see black circular rings. You can then take it that your crop has been attacked by early blight.

If, however, your crop is fairly grown up and you are in a hilly region you may find water-soaked areas appearing on the tips of leaves. These spots turn brown and finally black. You will find a whitish or greyish hazy growth round the margins of these spots on the lower sides of the leaves. If the weather is cloudy, the spots will spread and develop very rapidly. Within a day or two you may even find your plants dead and rotten, giving out a foul smell. Know it for certain then that your crop has been attacked by late blight.

Whatever may be disease—early or late blight—start spraying 5:5:50 Bordeaux mixture or any copper fungicide containing 50 per cent metallic copper at one pound in 20 to 25 gallons of water. You can also use 'Zineb' at one pound in 50 gallons of water. Spray every 10 to 15 days till your plants are mature.

You may find some tiny green insects in early hours of morning in your potato crop. These are the harmful aphids and jassids that suck the juice of potato plants and carry virus diseases, which as you know cut down your potato yields.

To control, spray your crop with 0.02 per cent 'Parathion' or 'Endrin.' You can add 0.1 per cent DDT and 0.1 per cent BHC to the Bordeaux mixture or a copper fungicide solution and spray on the crop every 10 or 15 days. This will control the diseases and the insects effectively.

If you happen to see the young leaves of potato plants rolling up or if they show yellow and green patches, uproot such plants and destroy them ; because these plants have been attacked by virus diseases and will give practically no yield but only keep on spreading the disease to other healthy plants and causing more loss.

Remember that this is the spraying time for you. Start doing it before any damage is done to your valuable crop. It is better to practise spraying as a routine for it helps in controlling the pests and diseases, resulting in bigger potato yields.

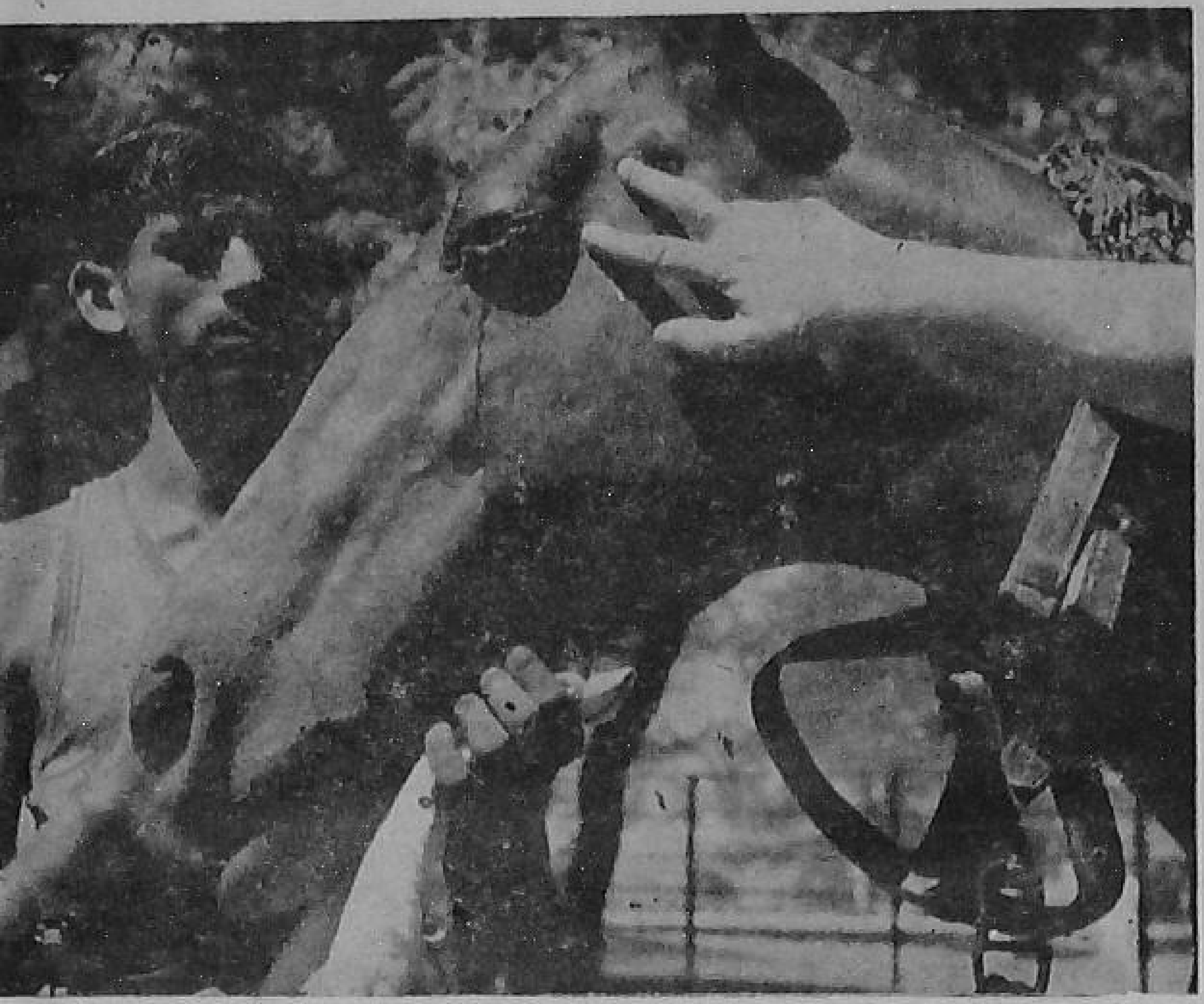
THE AFRICAN HORSE SICKNESS

HOW TO PREVENT AND CONTROL THE DISEASE

By K. G. MAHINDRU

SEVERAL thousands of horses in our country died in the last two years of a new disease. This disease, called the African Horse Sickness, is caused by a virus. It also attacks mules and donkeys.

The disease is highly infectious and is carried to healthy animals by biting insects and by some types of mosquitoes and blood-sucking flies. The disease appears more during and immediately after the monsoon when



There is a swelling over the eyes of the affected animal

these insects are found in plenty.

SYMPTOMS

Five to seven days after being bitten by insects carrying the germs, the disease appears on the animals. Animals then develop fever, running a temperature of 101° to 106° F. A swelling over the head and a running nose are the main symptoms seen. The swellings are easily seen over the eyes, near the nose and the lips and under the jaws. In some animals, the swellings may be seen also on the lower side of the belly or even on the legs. The eyes become red, with a swelling at the corners. The animals find breathing difficult though no coughing is seen. Some sick animals repeatedly tend to lie down and get up. They do not eat well. After the symptoms appear, the animals suffer for a few more days, usually for two to four days, then they die. Before death, the body temperature comes down to normal or even below normal.

Few animals suffering from the disease recover from it. Those that recover, however, do not get the disease again.

PREVENTION AND CONTROL

There is no treatment for the disease. A vaccine which can make an animal immune to the disease is being produced at the Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh.

The animals become immune to the disease after three months of vaccination. Animals can be vaccinated any time during the year, but it is better to vaccinate the animals from March to May, just before the monsoon. Five c.c.s of the vaccine is given to a horse, donkey or mule or young stock of proper age, After giving the vaccine, the animals should be given rest for three weeks. Vacccinated animals may have a slight rise in temperature between the 14th and the 17th day after vaccination, as a result. No treatment for reaction is needed, as it will pass off by itself.

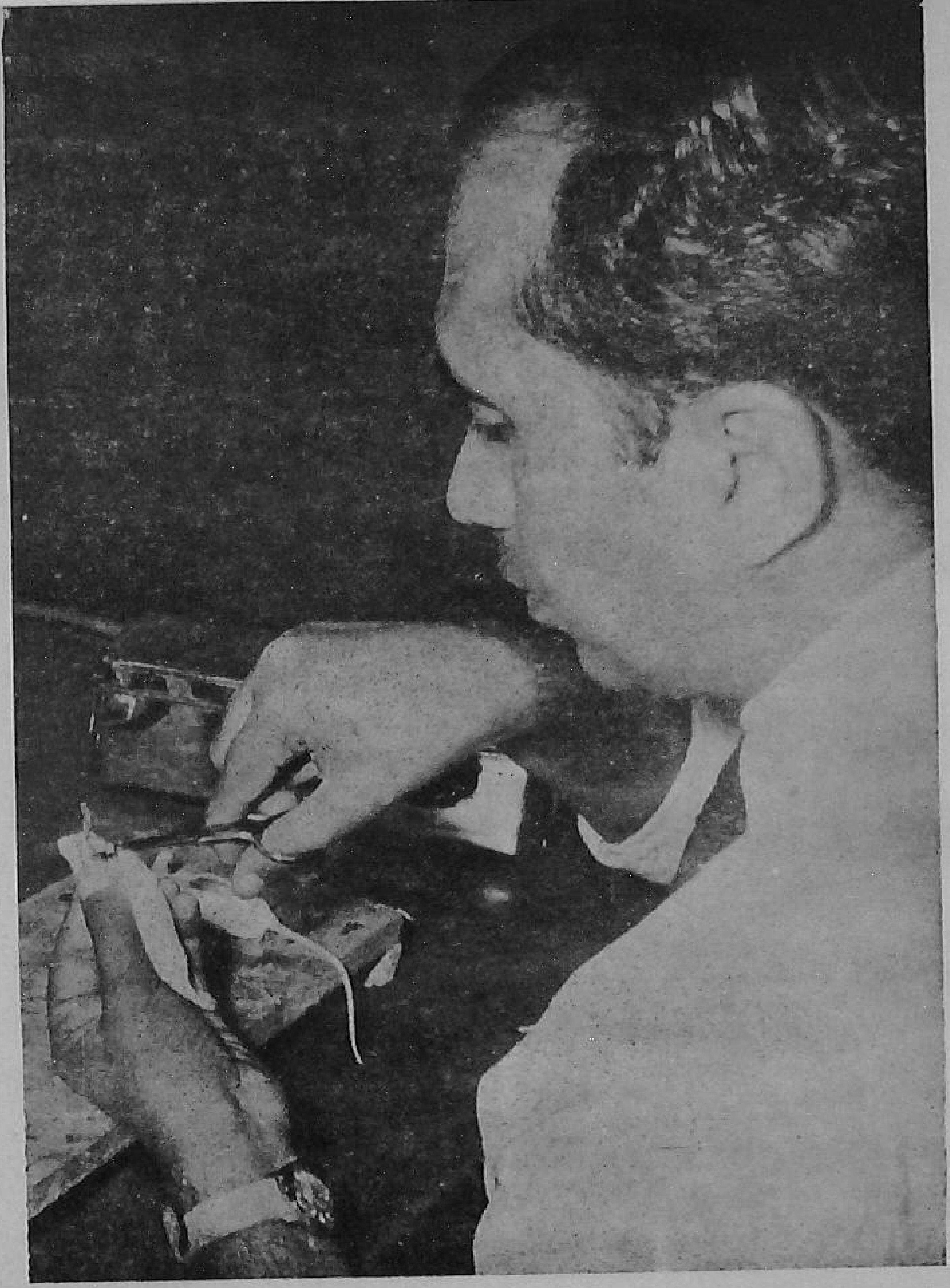
Do not vaccinate animals in an advanced stage of pregnancy or those which have just foaled. Mares which have foaled should be vaccinated only after a month of foaling.

The vaccination is given free by the staff of all State Animal Husbandry and Veterinary Departments.

In addition, the following precautions should be taken to avoid the sickness :

* Keep the animals and their surroundings thoroughly clean.

Frothy discharge from the nose is yet another symptom of the disease



The vaccine to make the animals immune to the disease is made from the brain of white mice]

* Clean the stable regularly and spray insecticides to drive away insects. Wire-nets of fine mesh should be fitted, if possible, on the doors and windows of the stable so as to keep off the insects carrying the disease.
* The stable should be well-drained. Water, urine, etc., should not be allowed to stagnate near the stable. All cess-pools near the stable should be treated with Creosote oil to prevent the insects from breeding. If necessary, the animals should be moved to a well-drained highland during the monsoon. The dung and litter should be taken away from the stable.
* The animals should be groomed regularly. In highly-infected areas, the animals should be sprayed with an insect repellent or the same should be rubbed on their coat. The animals should not be put to work or allowed to graze after sunset. They are to be stall-fed in the evening.
* Carefully watch for any sign of the disease in your animals. If an animal is off-colour or develops temperature particularly in the evening, in the affected districts, it is a sure sign of African Horse Sickness.

IN SUCH A CASE, IMMEDIATELY CONTACT YOUR NEAREST VETERINARY OFFICER FOR HELP.

AMMONIUM SULPHATE

THE MOST POPULAR FERTILIZER

By A. K. DUTT

AMMONIUM sulphate is the most popular nitrogenous fertilizer with our farmers. As most of our soils are poor in nitrogen, a major plant food, farmers have been using it for good crop growth and yield.

Ammonium sulphate is a crystalline solid, soluble in water. It keeps dry and does not cake easily. It is sold in the market packed in gunny bags.

It contains 20.5 per cent nitrogen. Over and above that, it has 25 per cent sulphur in it.

WHERE TO APPLY

You can use ammonium sulphate under different soil conditions and for almost all types of crops. It is especially beneficial to alkaline soils and those that need sulphur.

As it leaves an acid residue in the soil, you need to apply 110 pounds of lime for every 100 pounds of ammonium sulphate you add to the acid soils.

Ammonium sulphate does not work well in highly acid soils unless you lime them periodically. Also in soils where the bases of paddy plants become black and die due to what the scientists call 'sulphide injury', do not use ammonium sulphate.

HOW TO APPLY

You can use ammonium sulphate both as basal and top-dressing. While applying the fertilizer, remember the following points.

* Wetland paddy likes nitrogen in the form it is found in ammonium sulphate.

* Nitrogen in ammonium sulphate is retained in the soil, even if puddled or water-logged, and is not lost by leaching.

* Ammonium sulphate when applied to water-logged soils, loses some nitrogen-part in it as gas after some time. So, application in split doses at the proper time of crop growth is more beneficial and effective than applying all the fertilizer in one dose.

* Ammonium sulphate application gives best results with controlled irrigation.

Basal-dressing

For wetland paddy (rainfed and irrigated)

Apply the fertilizer to the ploughed field at the time of puddling prior to sowing or transplanting paddy.

For paddy, wheat, cotton, sugarcane, potatoes, vegetables, etc.

Apply this fertilizer during the final tillage operation before sowing or transplanting and mix it well with the soil by a plough or a harrow.

Top-dressing

The fertilizer can be top-dressed best over standing crops when the leaves are dry. If the leaves are moist, mix the fertilizer with dry sand or soil before top-dressing. For widely-spaced crops, apply it between the crop-rows.

For wetland paddy

If you can control irrigation, drain out the field, apply the fertilizer, mix it with the soil, and follow immediately with an irrigation. Otherwise, apply the fertilizer to the standing water and mix it with the soil as you do for a rainfed crop.

For dry land paddy, wheat, cotton, sugarcane, potatoes, vegetables, etc.

When this fertilizer is applied to a moist soil, mix it with the soil.

When the fertilizer is applied to a dry soil prior to irrigation, avoid overirrigation.

When the fertilizer is applied to a dry soil under rain-fed conditions, do not mix it with the soil.

FOOD
is a
MUNITION OF WAR
Don't
WASTE IT

HOW MUCH TO APPLY

Different crops need different amounts of nitrogen. The amount of ammonium sulphate which you may require to apply will, therefore, depend on the crops you grow, the type of soil on which you raise them and the cropping and manuring practices you follow.

Consult your local Extension Officer or Gram Sevak for specific fertilizer recommendations for your soil and crops.

HOW TO STORE AND HANDLE

This fertilizer is available in 100-kilo bags. If it becomes necessary to store the fertilizer after you open the bag, tie it up carefully after the quantity of fertilizer required has been taken out.

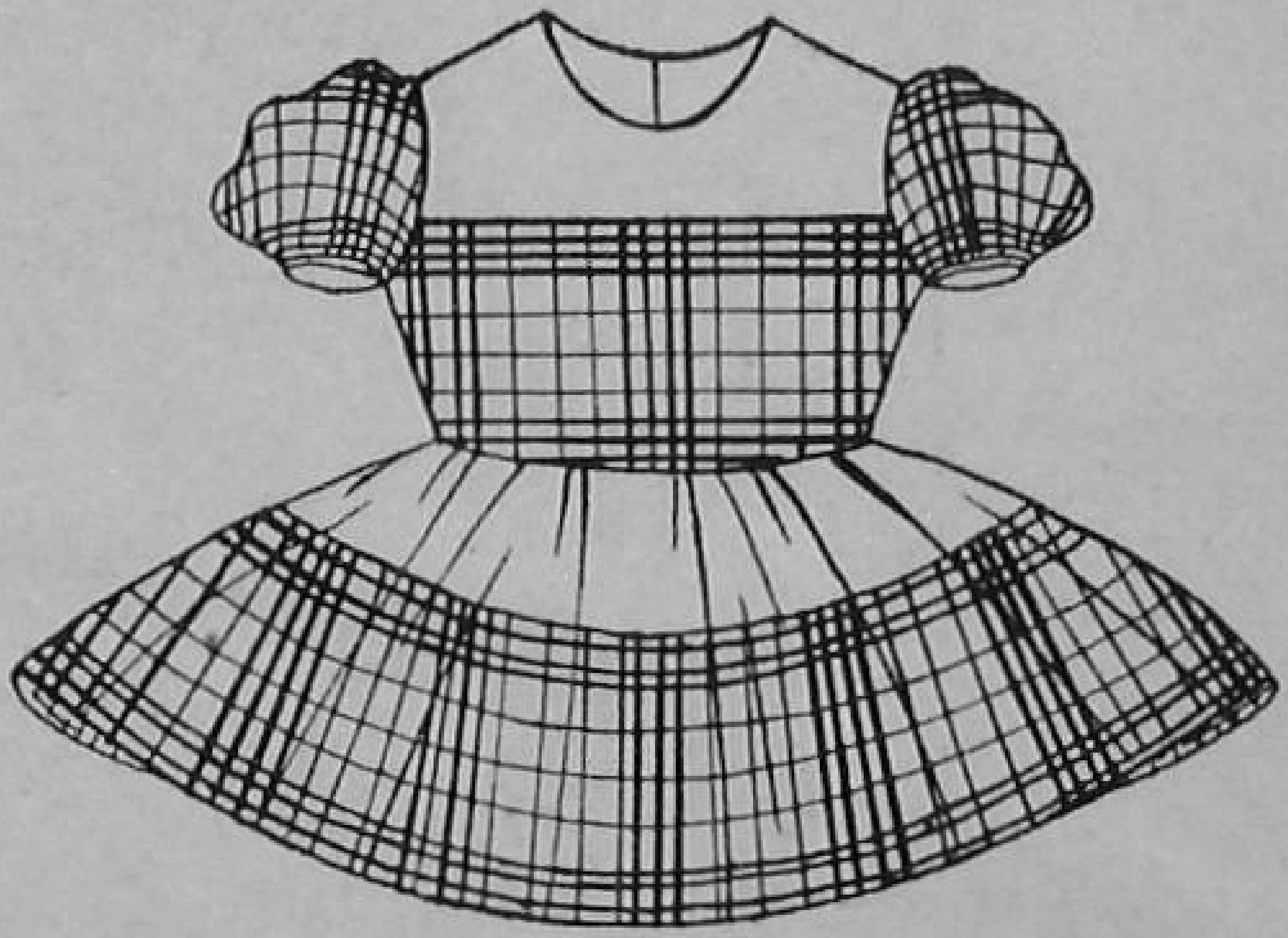
And remember the following points.

* Do not open the bag until you need the fertilizer.
* Do not allow the bag to come in contact with the damp or moist floor.
* Do not keep extra weights on the bag.
* Store the bag in a cool and dry place.

A NEW FROCK FROM AN OLD ONE for your little girl

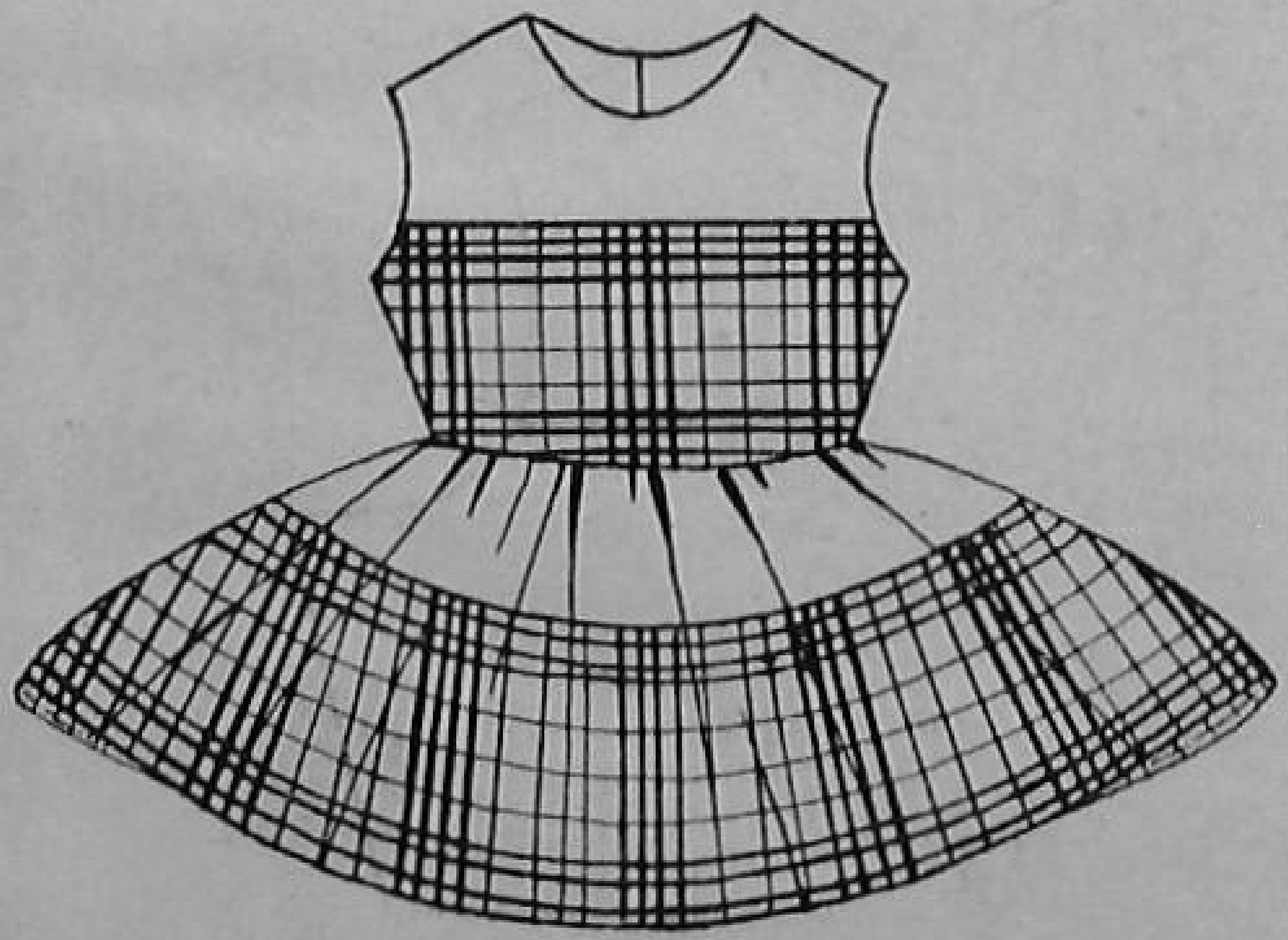
By KANTHIMATHI KUMAR

IT OFTEN happens that your little girl's frock which is not so worn out as to be thrown away, is still unusable because it has some frayed spots. This presents quite a problem if such spots are too many to be darned and mended.



(Fig. 2) The frock with sleeves

Here is a way to turn that frock into a new one. You can either make it with sleeves or without sleeves. The one with sleeves is smart; the sleeveless one is cool and comfortable. Both the designs bring out the colour combination to advantage.

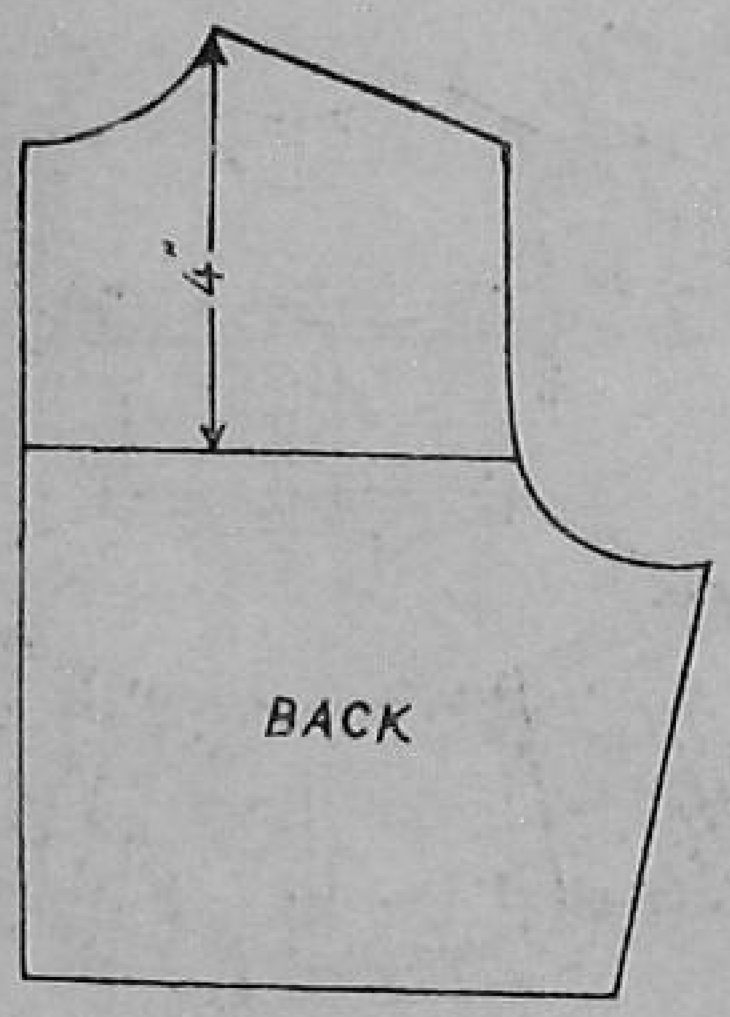


(Fig. 1) The frock without sleeves

Here we are taking as an example a frock (Size—20″ chest) which has some frayed spots in the front below the neck and some in the skirt as indicated in the diagram (See Fig. 3).

You can take either of the new patterns shown in Fig. 1 and Fig. 2. The same idea can be applied to make new frocks from old frocks which are good.

The original frock is of a green fabric with checks consisting of pink, blue, lime-green and white stripes. For renovation, the checked fabric is combined with plain lime-green material.

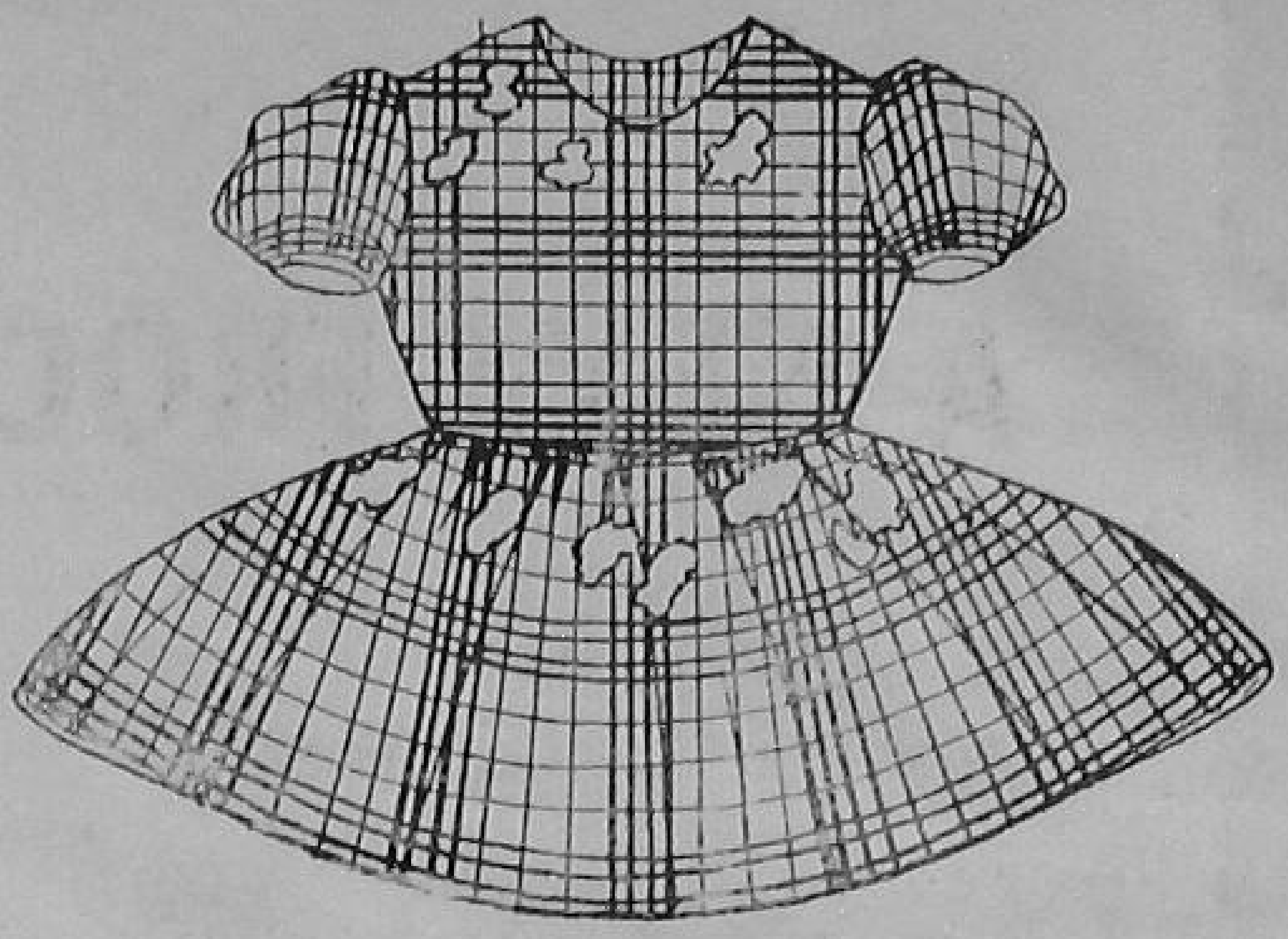


(Fig. 4a) Back of the bodice

Measurements of the original frock

Length 18″; Waist length 8″; Chest 20″; Waist 19″; Shoulder width 8″; Sleeve length 4″; Sleeve band 7½″.

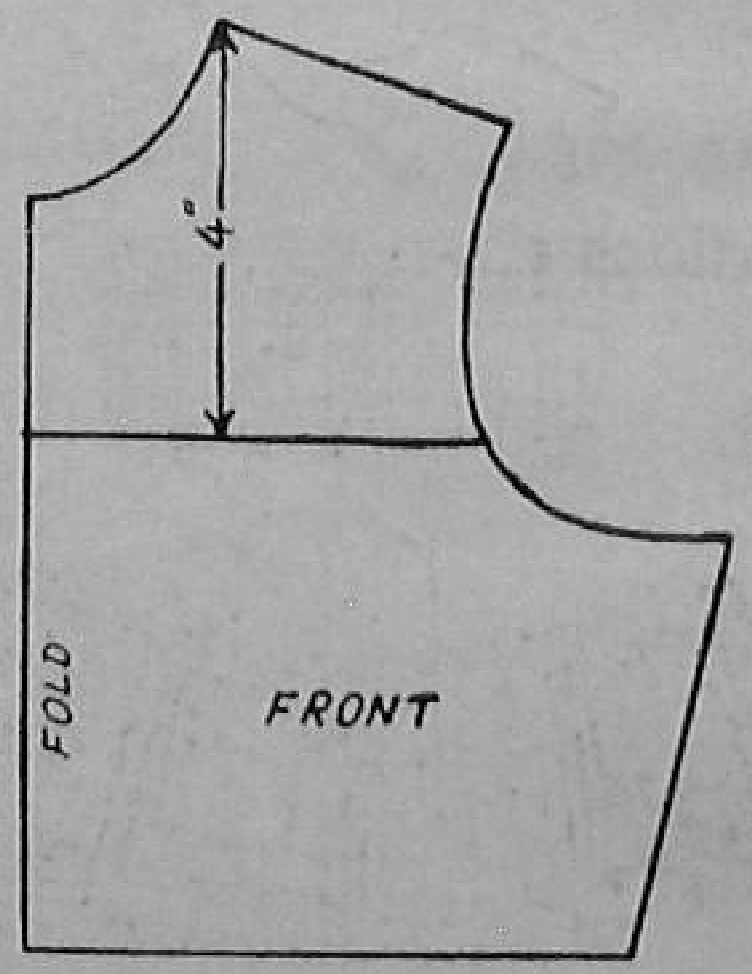
Material required for either of the new patterns: 3/8 yard of plain fabric of 27″ width, to match the material of the old frock.



(Fig. 3) The old frock

How to alter the old frock

Open out the seams at the arm holes, the waist-line, the neck-band, the button-bands, the shoulders and the sides of the bodice. Detach the sleeves, the skirt and the front and the back of the bodice. Rip open the gathers and the side-seams of the skirt. Iron the different pieces of the frock properly.

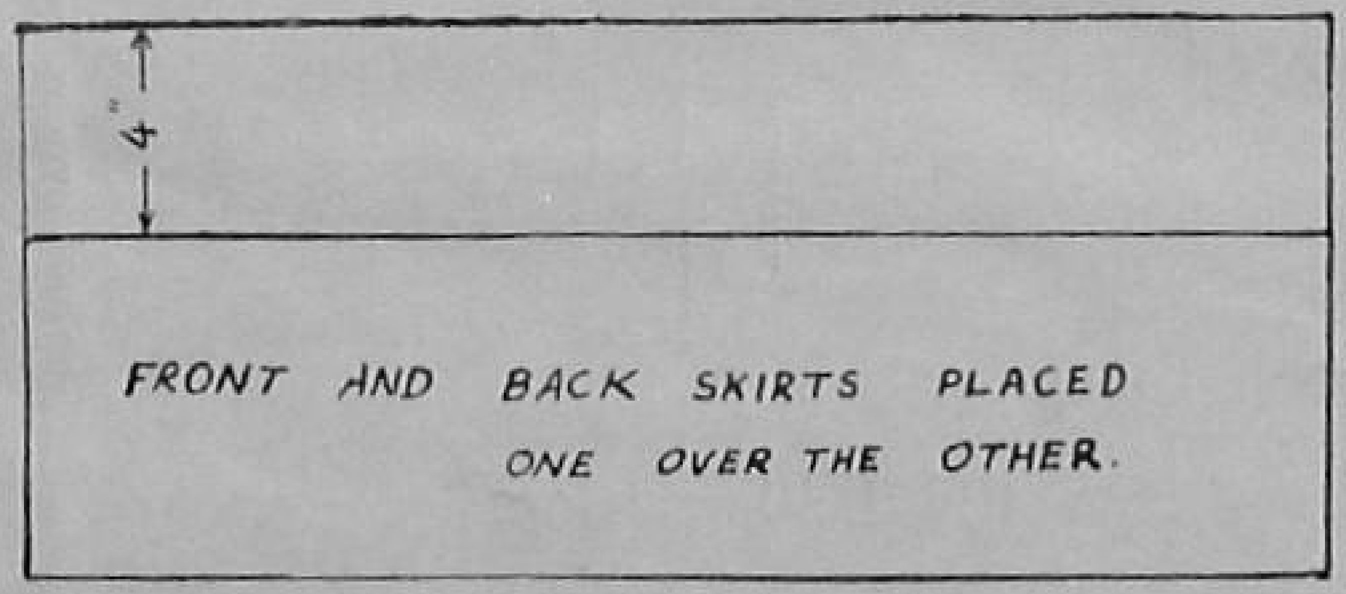


(Fig. 4b) Front of the bodice

Fold each of the front and the back bodice double across the body-width and measure down 4″ from the highest point of the shoulder-line, and cut across the bodice-pieces as shown in Fig.4a and Fig. 4b.

Place the front and the back skirts one over the other and cut away 4″ of material from the top of the skirts (Fig. 4c.).

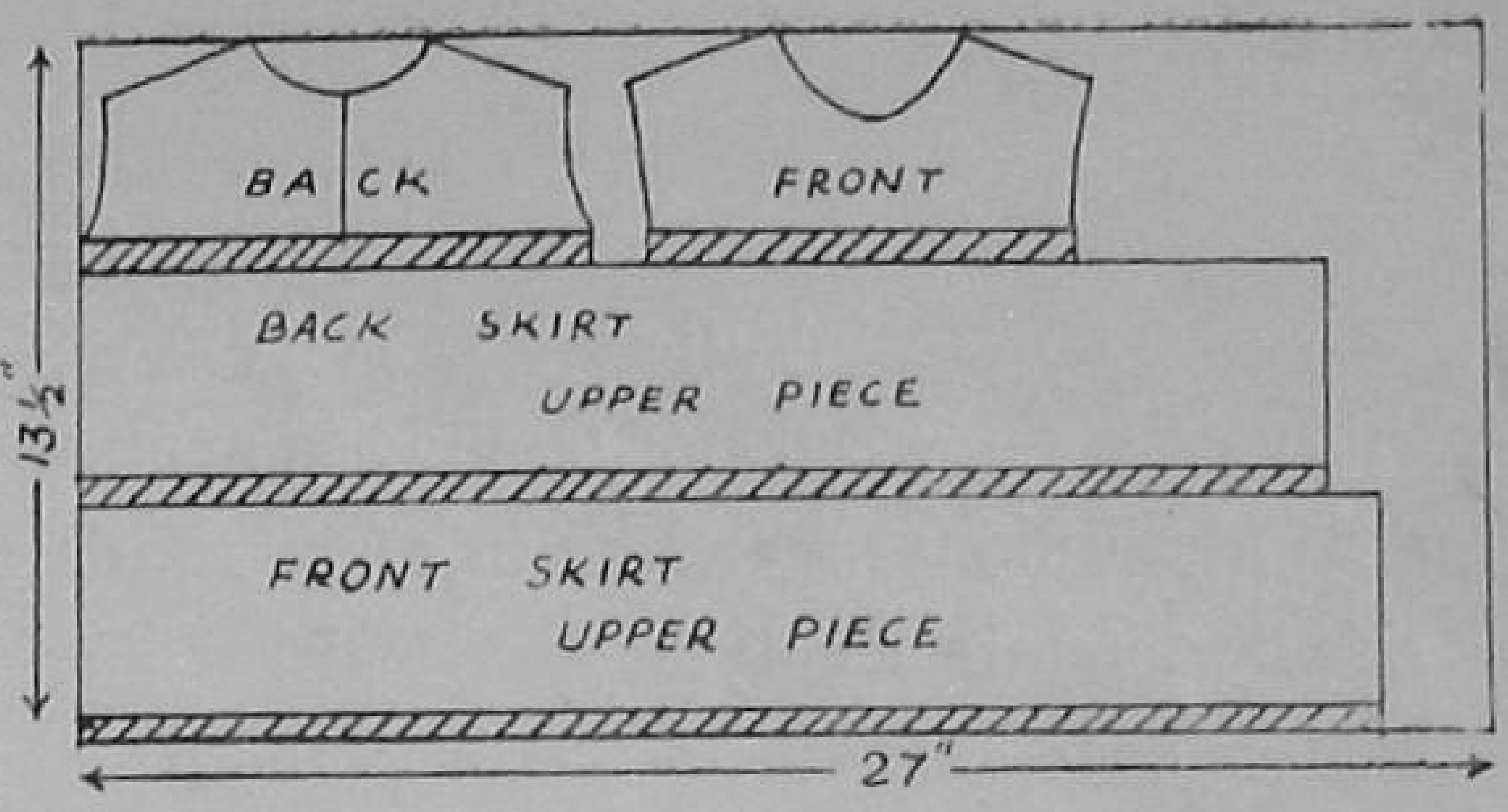
Pin the pieces cut from the skirts and the back and the front of the bodice to the plain matching fabric and cut the pattern pieces, allowing ½″ more at the lower end of each



(Fig. 4c) This is how you cut old skirt pieces

pattern (See Fig.5) . In the diagram, the shaded portions represent the extra material allowed.

Attach the upper portions of the bodice-pieces cut from the matching fabric to the lower portions of the original bodice, allowing 3/8″ for the seam. Make the shoulder-seams, allowing 3/8″ for the seams.



(Fig. 5) Layout of the pattern pieces

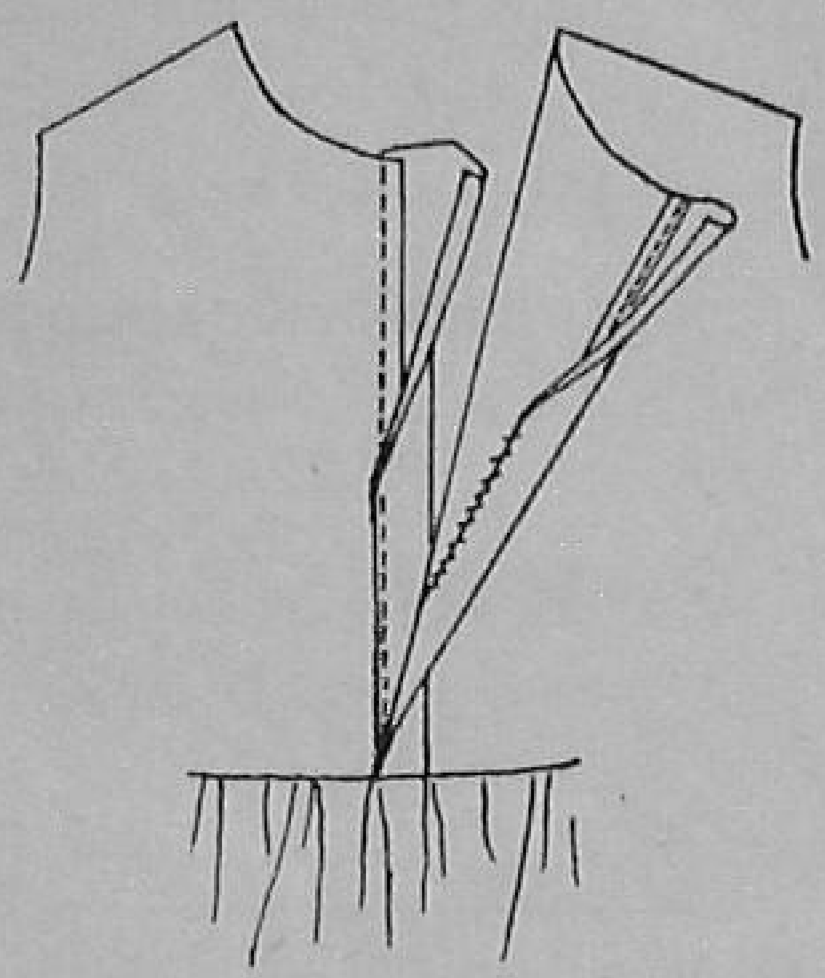
Make the side-seams of the bodice, leaving 2″ free in the left-side seam above the waist-line for the side-opening which should be completed later.

Face the right side of the opening at the centre back and make a protruding band at the left side of the opening (See Fig. 6). Place the facing over the band and secure them in position with a few stitches at the lower end of the opening.

Face the neck with a narrow strip of material cut on the bias and attach the sleeves for Pattern I or face the arm holes for Pattern II.

Join the upper portions of the skirt, cut from the matching fabric, to the lower portions of the original skirt-pieces, allowing 3/8″ for the seams.

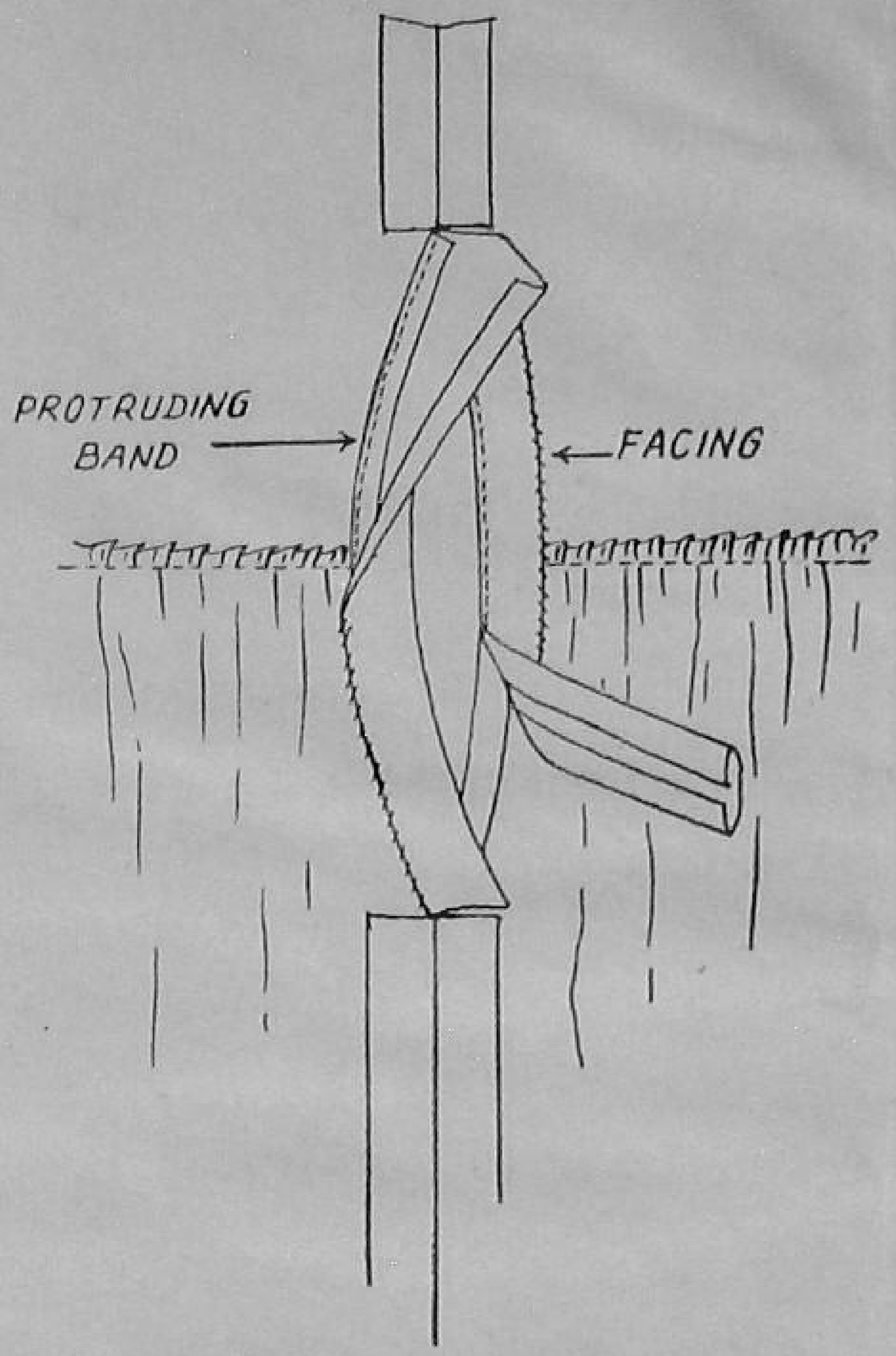
Make the side-seams of the skirt, leaving 3″ free in the left side-seam below the waist-line. Gather the top of the skirt to fit the waist and attach it to the bodice of the frock, so that the side-seams of the bodice and the skirt are in lines. Face the raw edge of the side-opening in the front and make a protruding band along the raw edge of the open-



(Fig. 6) Opening at the back

ing in the back skirt and fix them in position with a few invisible stitches at both ends (Fig.7).

Sew the necessary buttons and hooks at the back and the side-openings.



(Fig. 7) The side-opening

Now see how the old frock has turned into a new frock with a charming new design.

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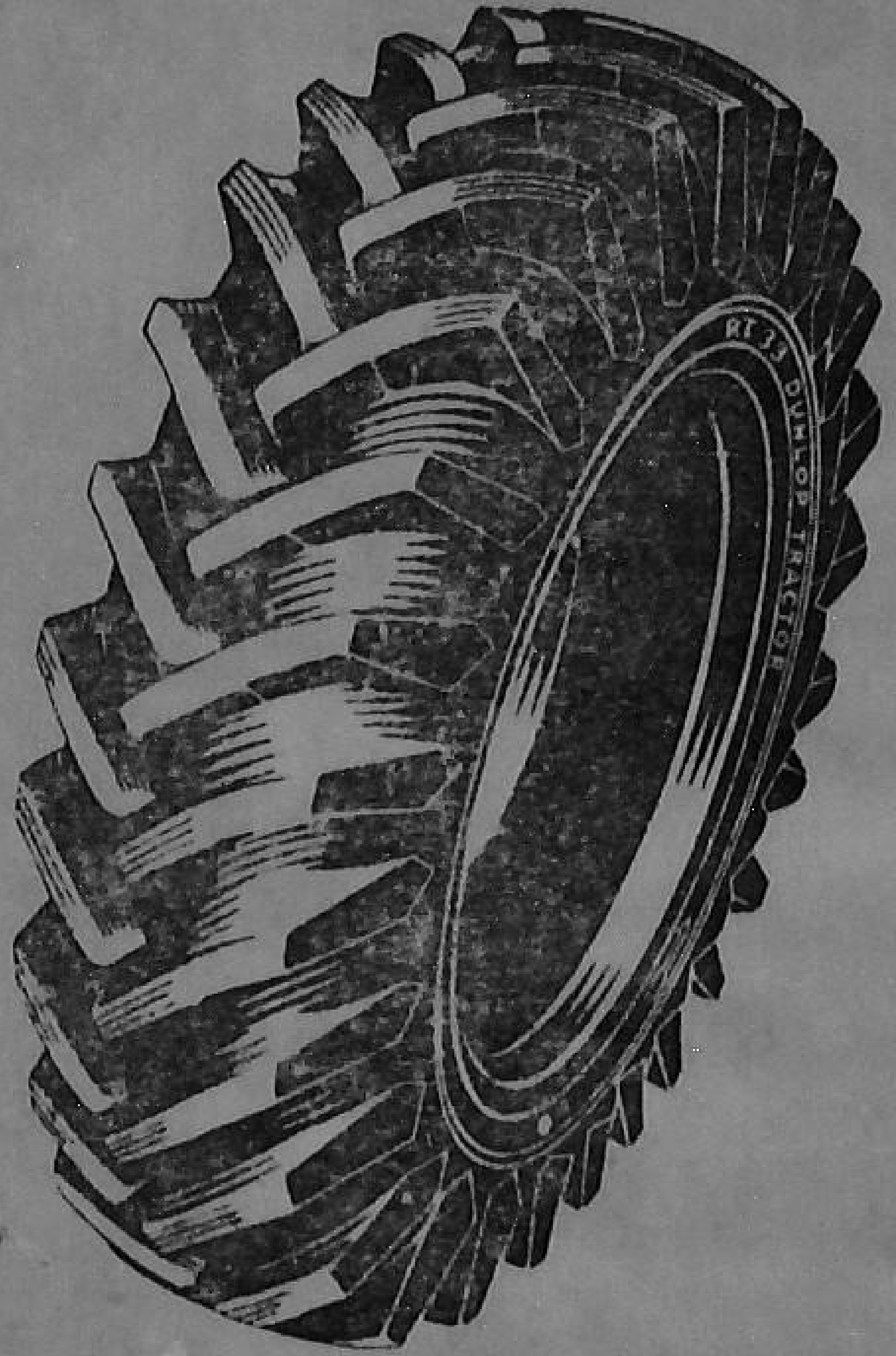

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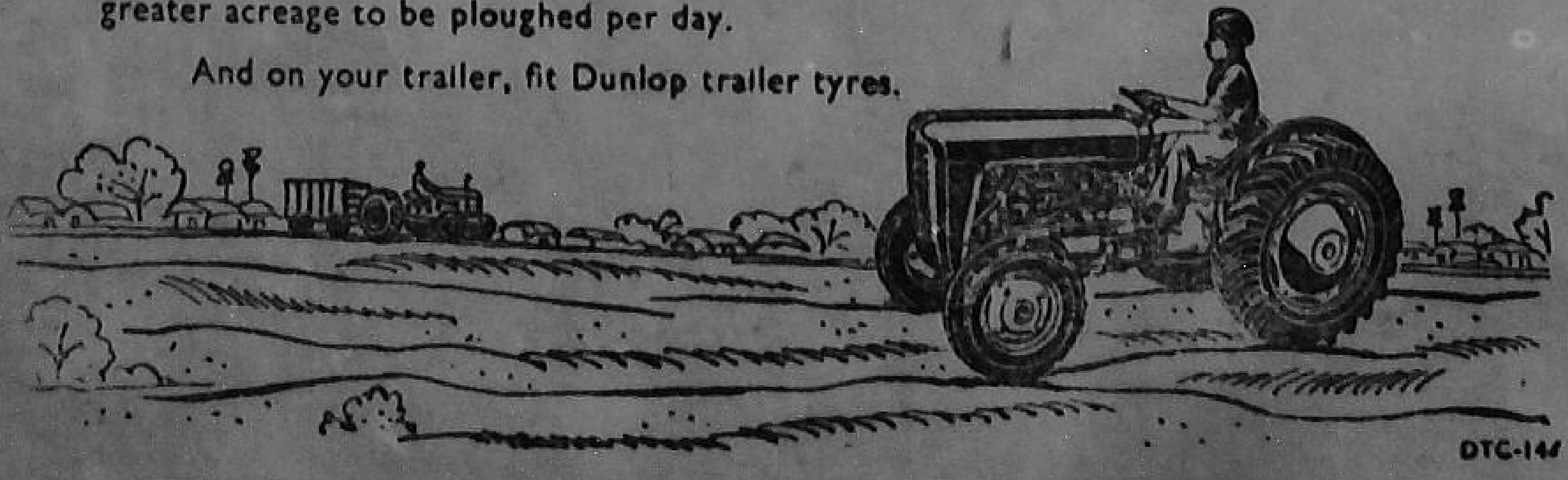

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